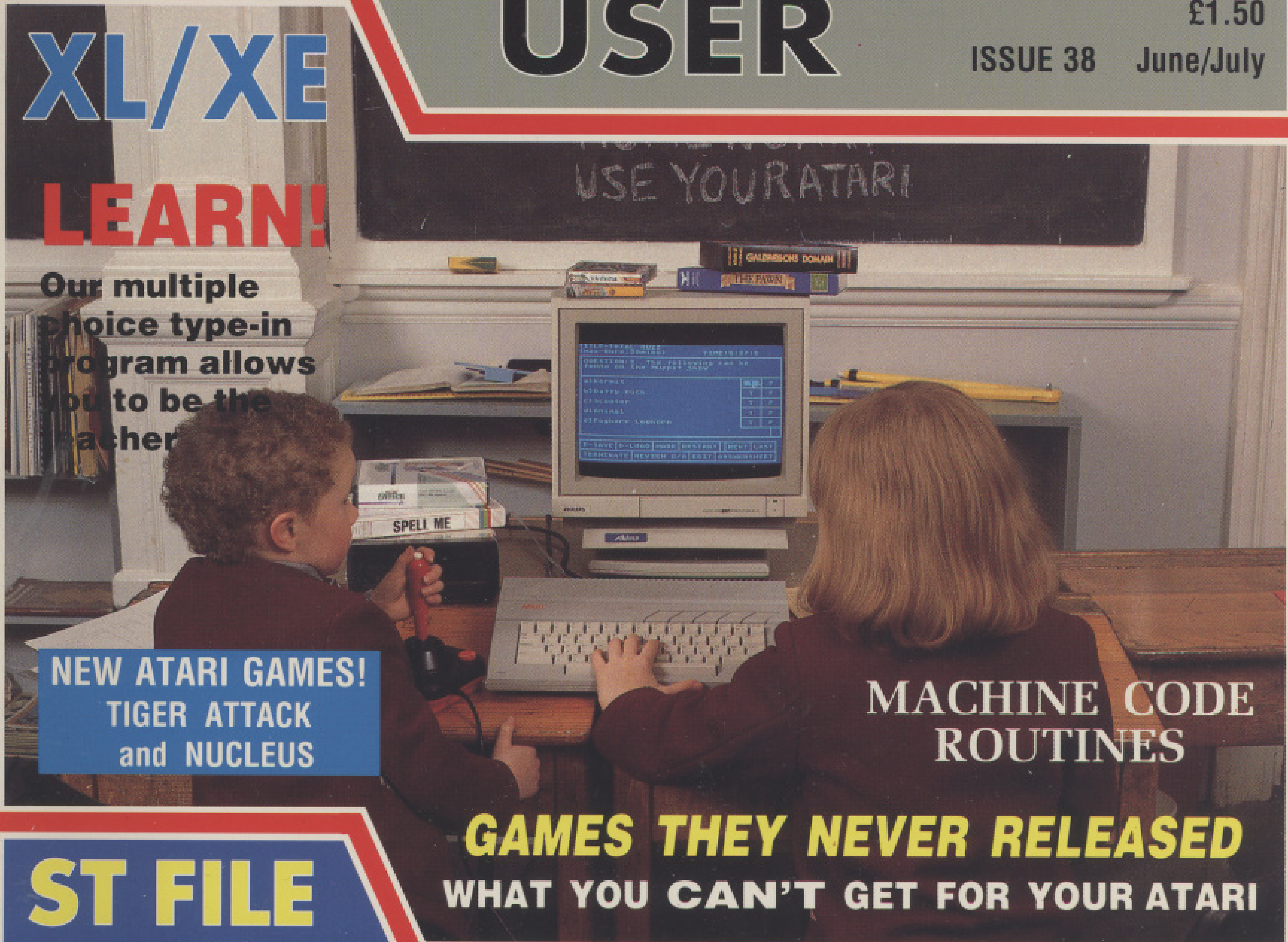
PAGE 6 PUBLISHING's

NEW ATARI USER

£1.50

ISSUE 38 June/July

XL/XE



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PAGE 6 *Adventures*

FOR YOUR ST

A range of quality adventures from some of the smaller software houses that are now bringing their long heralded talents to the ST

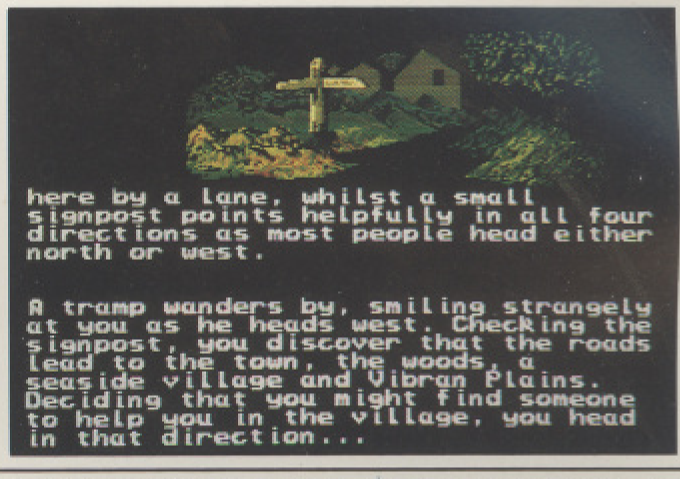
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A beautifully illustrated text and graphics adventure by Linda Wright in which you play Amora, the beautiful daughter of Lord Senidea of Nulom engaged to Amanton, a man that you father does not approve of. In an attempt to impress him Amanton announces that he will sort out the evil sorceror Mallumo, however young Amanton is soon captured and so is your father. You learn that only The Jade Stone is magical enough to overcome the evil Mallumo and so you must search for the Stone and rescue both your father and sweetheart

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Linda Wright has been writing adventures on other machines for many years. She is highly regarded in the Adventure world and many of her games have been reviewed in CRASH and other magazines. Her most recent game THE BEAST earned a 91% rating! In a world dominated by male writers, Linda brings a refreshing new approach to many of her adventures

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DOMES OF SHA is River Software's most successful adventure so far. Set in a far corner of the galaxy, an event was taking place that would not only affect the tiny planet of Olaxas, but worlds not even born. The surviving people knew that they must move or die but the Cold Fear has prevented them from going. Somebody must be strong enough to lead the people of SHA to safety

HAMMER OF GRIMMOLD is set in the land of dwarves where Grimmold, mightiest of the Dwarf Kings, is deeply troubled. His fabled hammer, a symbol of health and fertility, has been stolen bringing misery to the land. The noble adventurer is charged with recovering the Hammer of Grimmold but must first outwit the Hooded Men, deceive the Gigantic Orc and finally overcome Valk, the evil one

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Three totally different and absorbing adventures full of evocative descriptions and hidden messages - ideal for the newcomerFeatures include HELP, RAMSAVE, RAM RESTORE, OOPS and AGAIN

Author Jack Lockerby has written over a dozen adventures on the Spectrum and Commodore and is a highly regarded figure in Adventure circles. Many of his games have received praise from Mike Gerrard, writing in Your Sinclair, and several of his games have been heavily promoted by the magazine. Jack is a retired Mining Engineer whose writing talents have brought joy to thousands of adventurers over the past 3 years.

FOR YOUR XL/XE

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* Full colour animated race graphics
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GO .. GO ..GO!

You'll be jumping out of your seat with excitement!

See PAGE 6 Magazine Issue 37 page 29 for further details of this super program. Tape version has all the facilities and fun of the disk version except that the number of horse databases is limited. *AVAILABLE EXCLUSIVELY FROM PAGE 6*

ORDER FORM on page 49

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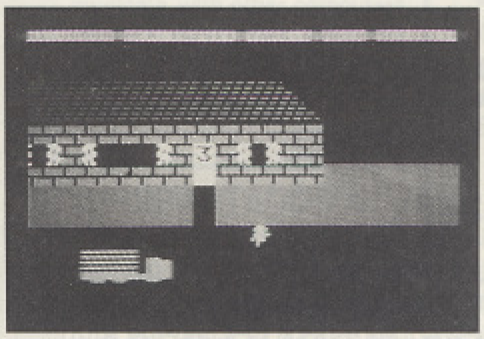
Simply the best all round business program for your Atari. Word Processor, Spreadsheet, Database, Label Printer, Comms, what more can we say? Hundreds have bought this hard to find program so we are continuing our special offer

SAVE £5 - SPECIAL OFFER PRICE £14.95!

'The magazine for the Dedicated Atari User'

CONTENTS

Issue 38 June/July 1989



THE PODZ
Hunt the aliens in this smooth scrolling game

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SUBMISSIONS

PAGE 6 welcomes and encourages its readers to submit, articles, programs and reviews for publication. Programs must be submitted on disk or cassette, articles should wherever possible be submitted as text files on disk. We seek to encourage your participation and do not have strict rules for submissions. If something interests you, write a program or article and submit it! Appropriate payment will be made for all published programs and articles.

The next issue of NEW ATARI USER will be on sale 27th July
Editorial copy date is 12th June

Editorial address: P.O. Box 54, Stafford, ST16 1DR, ENGLAND Tel. 0785 213928
Editor & Publisher: Les Ellingham - Advertising Sandy Ellingham - Assistant: Stacey Mitchell
Printed by Stephens & George, Merthyr Tydfil 0685 5351. Typesetting by The Setting Studio 091 232 1517
Origination (film, planning) by Ebony 0579 46880 - Newstrade Distribution Diamond Europress, Unit 1, Burgess Road, Ivyhouse Lane, Hastings, E. Sussex TN35 4NR Tel. 0424 430422
NEW ATARI USER is published bi-monthly on the last Thursday of the month prior to cover date

PAGE 6 PUBLISHING's

NEW **ATARI** USER

Issue 38
June/July 1989

'The Magazine for the Dedicated Atari User'

ISSN No. 0952-4967

THE CREDITS

All of the usual stuff is on page 3 but here are the people who made this issue possible.

Les Ellingham did the editing, layout etc.

Sandy looked after the advertising

Stacey did all those things around the office without which we would not survive (especially making the Editor's coffee!)

John R. Barnsley helped out too but complained that he didn't get any credit last time for making the coffee, so thanks for the coffee, John!

The Regular Contributors, who provide the backbone of the magazine and can generally be relied upon to come up with good articles and reviews, are ....

Garry Francis	**Mark Hutchinson**
Matthew Jones	**John Davison**
John Davison jr	**John Sweeney**
Paul Rixon	**Damon Howarth**

All other contributors for this issue are individually credited alongside their articles or programs. Thanks to everybody for sharing their work and enthusiasm with other Atari users.

Still no news from the antipodes

Thanks to **Paul Lingwood** for the cover photo and to Brooklands School, Stafford for allowing us to use their classroom. Thanks also to the two people who sat there patiently while all the lights and things were adjusted - **Danielle Sandy**, who didn't really find it as scary as she thought, and **Sean**, the best little person in the world.

Lot's of inspiration this time, especially from Bruce Cockburn who just stays in the head after the music has stopped, Jesse Winchester, back after a long, long while and still as good, De Dannan, who must be the very best from the Irish scene, Sipho Mabuse and Johnny Clegg from South Africa who show that there are a lot of good things in that country waiting to break free. If you were into Graceland, check out Sipho Mabuse. Other mentions must go to The Chieftains, Judy Collins and The Fureys who can still perform songs in a way that others can't. Finally thanks to Tower Records for having the good sense to stock CD's that the rest of the UK don't know exist.

NEW ATARI USER is the magazine, PAGE 6 is the concept. Wherever you see PAGE 6 you'll know what it means!

The next issue of NEW ATARI USER could feature YOUR article or program, so SEND IT IN NOW!

PAGE 6 shows just what you can do with your Atari. With the exception of final output on a Linotron and use of a repro camera for the listings and photos, the magazine is prepared entirely with Atari based equipment and software - not a Macintosh or IBM in sight! Hardware used includes 130XE, 1050 disk drive, 810 disk drive, 410 cassette (occasionally!), 850 Interface, NEC 8023 printer, 1040ST, SM124 Monitor, Atari SH204 hard disk drive, Cumana 1 meg disk drive, Epson RX100 printer, Kyocera laser printer, Microstuffer printer buffer. Software includes Superscript, Turbo Basic, Kermit, PC Intercomm, TARI-TALK, Print Wiz, PC Intercomm, STWriter, Protext and Fleet Street Publisher. Articles and programs submitted on XL/XE disks are subjected to various custom written programs before being transferred across to the ST via TARI-TALK. All major editing is done with Protext and pages are laid out with Fleet Street Publisher. A disk with the finished pages is sent up to The Setting Studio in Newcastle (a typesetting bureau who really know what they are doing with the ST) to be output on a Linotron 300 and, hey presto, finished pages are sent back. It really does work - at last! All that is left is to drop in the listings and photos. Well, it's not quite as easy as that, but you get the idea!

Editorial

FOR BETTER OR WORSE

So here we have the first issue of NEW ATARI USER or rather the 38th issue of PAGE 6! Preparing this issue was rather strange as I had to keep thinking of the new title rather than the familiar PAGE 6 and I must admit that there were misgivings about making the change but in the long run I am sure that it will be the right thing to do. Many readers have written asking us not to change, and I can fully understand their reasons, but we have to think of the larger commercial world and cater for both newsagents who haven't got a clue what PAGE 6 means and also for the new users who will more readily identify the new title. To confuse you even more, you will still find lots of references to PAGE 6 throughout the magazine partly because it is hard to break old habits but mainly because PAGE 6 has come to mean more than just the magazine, it supports Atari users in other ways. So what we now have is PAGE 6 as an overall concept of support for the Atari with NEW ATARI USER as the magazine being published by PAGE 6. You can now think on two levels, those who have been with us a long while can still call us PAGE 6 (and that includes me!) whilst those who just see the magazine as a straight magazine can refer to NEW ATARI USER. Basically think of us how you always have, nothing's changed except the name on the front cover.

AN 8-BIT SHOW?

There is an report in this issue concerning the London Alternative Micro Show which raises some interesting points about the future support of the 8 bit Atari. It seems that our news item last issue caused a good number of you to go along to the show to the delight of those stallholders supporting Atari and this has fired Colin Hunt of the Bournemouth and Poole Atari User Group to start thinking about a similar show for the Atari 8 bit machines. Mark Hutchinson, without having seen Colin's report, also puts forward the idea in his column. Now I have been thinking about this for at least two years and have this idea constantly spinning round in the back of my head about arranging a show that would be something really unique in the world of computer exhibitions, not so much a show as an Atari Convention. What sparked this off was attending a Fantasy Convention in a hotel in Birmingham some years ago which showed that there is much more to 'support' than getting a few retailers together to sell their wares. The idea is to hold the show somewhere reasonably small for atmosphere, invite those retailers who still support the 8 bit as trade support but also get together as many 'experts' as possible to demonstrate various aspects of using the Atari. We could have someone who knows Flight Simulator II inside out showing their paces, experts on Turbo Basic, Machine Code or other languages, hardware hackers, folks who use their Atari for business and many more, all with their own corners so you could go and talk to them. There could be a panel discussion on various topics, competitions and much more. In all you would get the chance not only to buy some elusive software, but also ask questions and know that you will get answers. In short you would come away knowing more about your Atari and what it can do. Isn't that better than trogging round a big show and coming home with just 50 blank disks at a bargain price?

The reason that I have never done anything about this is that I know that I could not possibly organise it as, with all the other things we get involved in, there is barely enough time to organise the magazine each issue! Maybe the tide is turning and others will start to pick up on this idea and perhaps if enough of us at the 'business' end get together we can make it work? In the meantime, I understand that the next Alternative Micro Show is to be held in Stafford and if that's the case, we'll definitely be there, it's only a mile from the office!

If you are an ST owner, don't think that all this talk about an 8 bit only show is leaving you out, it's just that you don't need any help at the moment. With the Atari Computer Show being virtually all ST and ST software all over the place and in every magazine, you are flying high at the moment, but your turn could come!

TAPES

Lot's of you ask for various things on tape so this issue we are making available a tape version of the great bonus program UNDER STARTERS ORDERS from the last issue. In the past many have asked but few have bought and as tapes have to be duplicated in bulk it is easy for us to lose money with poor sales. We don't want to make a fortune on this tape but if we lose money then it is pointless doing it. It's up to you, if you want tapes show us that you are willing to buy them.

Les Ellingham

JOHN SWEENEY FINDS THE HOLY GRAIL!



We always knew our reviewers were good but little did we realise that we had the best in the whole of the UK! We were delighted to receive an announcement from Mandarin Software that the winner of their recent £5000 Lancelot 'Holy Grail' competition was none other than John Sweeney who has been gracing these pages with his adventure wisdom for a number of years. John worked his way through some obscure clues in the early rounds of the competition to join 40 finalists who had to battle it out with some really difficult questions which revealed the Ordnance Survey grid reference of a location at which the Grail was supposedly buried. In typical fashion, John not only answered the questions, but provided lots of additional information to support his answers and even came up with one or two facts that the organisers themselves had not thought of!

John thoroughly researched the legends of King Arthur and used around 30 reference works including out of print works and references obtained from Universities to solve a set of questions which were set by Pete Austin from Level 9 and are difficult enough to solve, even with an answersheet! The hardest part was trying to solve one question that the organisers had worded incorrectly so that it could not be answered(!) but John nevertheless got the most questions right within the allotted time and worked out that the Grail was buried at the Cerne Abbas Giant in Dorset. And so ... John Sweeney became the proud owner of a 22 carat gold plated 'replica' of the Holy Grail encrusted with amethysts, garnets and opals.

Strange to think how things come full circle. There was your editor interviewing Pete Austin sometime last year when a fax came through with the initial design for the Holy Grail. I was invited to make some suggestions on the final design and then totally forgot about it, until John Sweeney completed the circle by ending up with the finished Grail. We didn't even know he had gone in for the competition! Well done, John, well done!

ENCOUNTER WITH ATLANTIS

Budget software company Atlantis, a major supporter of the Atari 8-bit machines has secured the rights to release Novagen's ENCOUNTER in budget format. ENCOUNTER was a breakthrough in Atari 8 bit games at the time of its first release and is one of the finest games to have been written for the Atari in this country. Indeed, it influenced several later U.S. games and was the first game to have turned the tables by beating the U.S. programmers in game design.

ENCOUNTER remains a superb game and at £2.99 should be gracing everybody's Atari. The budget rights for the game were not cheap and Atlantis need it to sell well but managing director Michael Cole is confident that it will succeed quoting the Atari 8 bit market as being "very buoyant at the moment".

We don't like to hype games at PAGE 6 but we can honestly say that this one is a classic and Atlantis deserve your support for bringing it to a new audience. Rush down to your local shop or give your mail order supplier a ring and demand a copy of ENCOUNTER. It will be one of the best £2.99's you have spent on your Atari.

DON'T FORGET THE SHOW

This is our last issue before the Atari User Show so this is a timely reminder to come along to Alexandra Palace between 23rd and 25th June to see the show. No news at present as to just who will be exhibiting but it will probably be the usual fare. There are rumours that there may be a special 'Meet the Editors' forum and a competition to find the best use of an ST so it looks as if there may be a slight change to the format. Come along and see, or at least see us!

YES, THERE IS NEW SOFTWARE

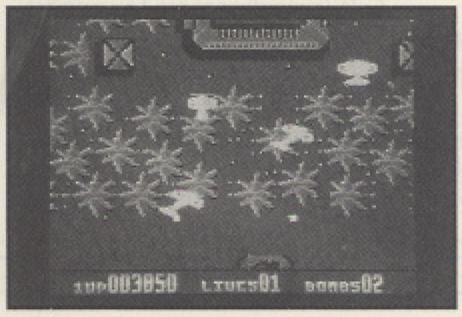
Codemasters are dipping into the Atari 8 bit market with two new releases promised over the coming months. The first is **FRUIT MACHINE SIMULATOR** which, as you might have guessed, is another fruit machine game. Not exactly novel on the Atari but welcome nevertheless as a new release in a market currently sparse on new software. This is to be followed by an, as yet, untitled car racing game that combines the traditional race track with fantasy battles as each car is armed with a number of weird and wonderful weapons. Price and release details are not confirmed at present but these are certain to be budget releases.

Atlantis are also keeping up their Atari support with "a number of new releases planned" although their present efforts are going into supporting **ENCOUNTER**.

Rambit, well known for their cassette based utilities, are putting the finishing touches to a revolutionary new word processing utility that will combine graphics with conventional word processing thus enabling you to print out decorative letterheadings at the same time as your words. This promises lots of exciting uses and we will bring you a review as soon as the program is completed.

Tynesoft, once a major supporter of the 8 bit, are now more into the high flying ST market but are still working on **THE LAST GUARDIAN** with a release date still some time away. At least they have something in the pipeline, although they have no other releases planned.

There are rumours of a new one from Anco called **CYGNUS X1** which is on a 'Buck Rogers' theme with a careful balance required between using fuel and shooting. Background graphics are said to be extremely colourful with some excellent intro music. Nothing more is known at present. Keep your eyes open and let us jnow if you hear of any other new releases.



Atari's great new game TIGER ATTACK reviewed this issue

WORLDWIDE SUPPORT

Over in the U.S.A. they are having similar troubles in finding support for their Atari machines and one enterprising user has set up the Federation of Atari Computer Enthusiasts (F.A.C.E.) which aims to bring together the resources of Atari 8 bit users worldwide. Primary aim is to provide support for those who don't have access to a local user group by providing a regular newsletter and disk containing selected public domain software and news files. Also planned is a supply support group which will find sources for spares and accessories for Atari hardware that are rapidly becoming hard to get hold of. There is a Bulletin Board and the Federation hope to attract commercial advertisers both on the Bulletin Board and in the newsletter.

All of this is dependent of gaining enough support from Atari users worldwide. Annual membership outside the U.S.A. is $18 ($10 in the U.S.) but before parting with any cash we suggest interested users drop F.A.C.E. a line to check that they have got off the ground and requesting further details. You should write to F.A.C.E. c/o Eric Lambeth, 1000 Westview Drive, Springfield, MO 65807, U.S.A. Enclose a couple of International Reply Coupons.

MAILBAG

write to
Mailbag
P.O. Box
54,
Stafford
ST16 1DR
ENGLAND

DVORAK KEYBOARD

Like a lot of other people the speed and accuracy of my typing leaves something to be desired especially when word processing. I am sure that some of these problems are caused by the idiosyncratic standard QWERTY keyboard layout. The alternative DVORAK layout has many advantages and has been approved by the American National Standards Institute so I am keen to try it rather than just improve my QWERTY skills.

I have found references to Dvorak and keyboard tables in Mapping The Atari and in Compute!'s Third Book of Atari and experimented with Designer Keys from Issue 36 but the redefinition disappeared when I loaded Speedscript. Is it actually possible on an 800XL to run an initial program to redefine the keyboard layout within any other program such as a word processor?

Mervyn Smith,
Sheffield

It is certainly possible to redefine the XL or XE keyboard but you would have problems if using a commercial word processor that boots up. Programs such as Speedscript however, which is a type in listing and for which the source code is available, should be capable of being adapted. The superb public domain program Textpro may also support this facility, does anyone know? Someone may have already done this, it is certainly quite feasible for any competent programmer. Any answers?

LOOKING FOR BIRDS

This might seem rather strange but I am very interested in bridwatching (the feathered kind!) and spend many hours recording species and numbers of birds seen, along with areas visited. At the moment I record my findings in loose leaf folders but I wondered if any of your readers have a successful program which they use and are willing to give me any ideas how to go about recording things like this on my ST?

D.I. West
St. Neots

There are several public domain databases that you might be able to adapt but it is difficult to recommend one without knowing your precise requirements. Something like ZAP-CARD, available from the PAGE 6 Library, might be suitable. This is just like a set of index record cards held in memory and the format is fairly free. Then again there may well be readers with a similar type of 'recording' hobby who have used other programs. We will gladly pass on any recommendations providing they are addressed to Mr West c/o Mailbag.

THE DREAM MAGAZINE?

Here is a rundown of what I want of PAGE 6 Magazine in future.

1. I require 150 pages devoted to the ST in full colour. As there are a few dozen 8 bit users among your readers and not wanting to be a spoilsport, you may devote two pages to 8 bit material.
2. No Top 10/Top 20 tables, please. Incredibly boring. Who really cares what is the 11th best selling game?
3. A series of articles on programming in machine code, C code, GFA, STOS and other languages.
4. A readers question and answer page (ST only of course)
5. Add on projects such as speech synths, hard drives, build your own printer, coffee machine etc.
6. Wiring diagrams to connect a variety of monitors.
7. Complete circuit diagrams of the 520 and 1040 machines and also both internal and external drives. Also a course in fault finding with a compre-

FINDING A GOOD SHOP

Referring to Atari Games Centres in the last issue, I would like to say that not all the centres who advertise in the computer press are bad. I am writing to praise my local centre which is MILES BETTER SOFTWARE. This is an excellent example of a dealer who supports Atari whether it is 8 bit or 16 bit. They have an Aladdin's cave of both software and hardware, games, education or business.

The staff are excellent in all ways in helping you and they have an excellent mail order facility. This is the sort of centre that deserves all praise that can be given. It is also nice to know that we Atari 8 bit users have still got centres like this who give us all the support that we desperately need. It is also up to us users to keep on buying from centres such as this to let them know how much we value their support.

I would like to close by saying that the magazine goes from strength to strength and say thank you for all your hard work and hope that we may continue to have an excellent magazine for years to come.

G.D. Wood,
Cannock, Staffs.

Nice to know that you can find a good local retailer but isn't it strange that these retailers who are supporting the Atari never tell anybody about it? Miles Better have been advertising for years, mostly in the old Atari User, but their advertising has never given away the fact that they have a shop. I never knew this, assuming that they were just mail order, and Cannock is only a dozen miles down the road! We also had a letter from Capri Marketing, who recently attended the Alternative Micro Show supporting Atari, saying they have over 200 8 bit titles in their shops which include two Computer Cavern out-

hensive fault finding chart.
I look forward to your 'new look' PAGE 6 ATARI ST USER magazine.

Les Howarth,
Preston

With my sense of humour dulled by too many late nights I can't work out how much of this letter is serious. The only thing we are working on at the moment is the add on coffee machine but we are having problems with the multi-tasking software. Trouble is, every time I sit down to work on the program, I have to pop out for another cup of coffee.

BIGGER PRINTING PLEASE

I am writing to you like many others have done to ask you if you could please do something about the printing in your magazine. When it used to be just Atari User, I had no trouble typing in the listings because the print was quite bold. I used to have your PAGE 6 magazine when it was just that but cancelled it because of the print on the listings. Ever since I have had the computer back in 1987 I have typed in every game out of Atari User and I miss it very much. I don't want to cancel my order as I like typing in the games so could you please do something about the print?

A.A. Betts,
Birmingham

A few people have mentioned this problem but we are caught between keeping all of the listings in large print or cutting some of them out. We have only a limited number of pages and like to give you as much as we can in each issue so some of the longer listings have to be reduced in size. If we didn't do this some of the longer listings might take up 6 or 8 pages and other listings or articles would have to be cut out. Let's be fair though, in the last issue BLASTCOM, FINDER, the Basic programs in the MACHINE CODE LIBRARY, SUNPLOTTER, AMAZING, TUTORIAL SUBROUTINES, and one of the TURBO BASIC programs were all in print every bit as large as the old Atari User and the only small print was for SCROLLY TEXT EDITOR and one of the TURBO listings. We could have made Scrolly Text Editor much bigger and then you would have lost one or two of the other listings. With this balance is the complaint justified? The typeface we use is also smaller than many but that again is so that you get more to read. Many of the other magazines fill up those 'extra' pages by using a larger typeface and therefore make the same material go further, should we do the same? Is the 'small' printing really a problem? Veteran Atari man Ken Ward mentioned it at a recent show but then Ken is getting old now!

SOME SENSIBLE COMMENTS

I would like to respond to some of the items from Issue 37. Firstly as to the matter of listings on tape, a definite yes to this suggestion. I would go further by offering a tape subscription similar to your present disk scheme.
Secondly could you thank Ian Finlayson for his Cassette database. I would like to comment on R. Hill's idea of program challenges, he suggested that PAGE 6 sets the challenge but could I suggest that the readers set the challenges for your own programmers or readers. Could I start the ball rolling by challenging anyone to write a mini word processor?
Thirdly to the critics from the old Atari User. Database would never have dropped Atari User if it had been as popular as they think it was. I find that of the magazines writing for the 8 bit Ataris, PAGE 6 has been the best. As for Get It Right versus TYPO 3, both have their advantages and disadvantages, TYPO 3 is quick and simple to use while G.I.R allows abbreviated commands to be used.
Finally on games centres, who needs them when PAGE 6 gives us such good games for the price of the magazine?

David McLaren
Renfrew, Scotland

We have put together a boot tape version of UNDER STARTERS ORDERS which was the disk bonus last issue, and will quite likely do a compilation of five of the best games from previous issues on tape. Whether we do any more is up to you. Unlike disks, where we can copy as many, or as few as we need, tapes have to be duplicated in bulk by an outside firm. If we get left with a lot, we lose money and we can't afford to do that. Much as we would like to provide all round support we can't if it is not economic. Buy these tapes and we will guarantee more. Programming challenges are a non starter, people will just not respond. Last issue we called for scrolling text messages using Scrolly Text Editor and so far have only had about half a dozen. If Atari users can't respond to something that needs simple English words there is no chance of responding to complicated programming challenges. Thanks for the letter anyway, did anyone spot the salient point that all that critics and moaners seem to have totally missed?

XF551 PROBLEMS

You asked in the last issue if anyone else has had problems with the XF551 disk drive. I have!
It is advertised as being able to format in double density and double sided, yet the DOS 2.5 supplied with it is not capable of this. Furthermore it will not format the reverse side of a disk at all. Would this be something to do with the timing hole of the disk? My old 1050 drive will format both sides of a disk provided a notch is cut in the right place.
Unless the XF551 is supplied from the outset with a DOS that justifies the advertising then surely the suppliers are liable under the Trades Description Act?

E.G. Mitcham
Solihull

You are probably right about the Trades Description Act. There are several reports in the States that DOS XE, written specifically for this drive, is now available but still no news here. The best DOS you can get at present is MYDOS which will use all the facilities of the XF551 and is now public domain. We have had a copy on order from our contacts in the U.S.A. but it has been a long time coming. As soon as we receive it we will add it to the library for the benefit of other users. If anyone has the latest version of MYDOS or DOS XE perhaps they could let us have a copy.

MORE OVERLEAF

lets. These have now been added to the Resource File at the back of the magazine but, as far as I am aware, Capri Marketing have never advertised! Atari World in Manchester are also supposed to be good with the 8 bit but, whilst they have advertised in the past, no one outside Manchester seems to know what they are doing now. When will all these people wake up and realise that with the scarcity of support for the Atari 8 bit, people will travel hundreds of miles to visit a shop with a good selection of software or hardware? If I had a shop with a good selection, I would take advantage of the situation and advertise the fact. Stick in some details about local attractions and have a special 'open day' with treats for the kiddies and you will get families travelling miles for a nice day out with the chance of getting some hard to find software for when they get home. Or am I still living in that dreamland of yesterday when people actually cared?
We may very well do a feature on the 'best' shops serving the 8 bit and if you have a local shop that you can recommend (including the ones mentioned) then write and let us know. Who knows, maybe one or two retailers may even be disposed to write and let us know they are there.

THOSE OLD ATARI USER LISTINGS

Last issue we said we could not help out with old Atari User listings but we have heard from a couple of people who are willing to help. To begin with, Mike Parfitt provided an answer to the problem raised by Simon Bowyer concerning the 'Customised Default Screen' listing. Several bits of data were missing and the line should read

260 DATA 240, 8, 201, 135, 240, 4, 201, 134, 208, 31, 173, 43, 2, 201, 32, 176, 24, 205, 16, 7

That's the last correction we are going to print from Atari User but the following two folks are willing to help you out.

Firstly J. E. Robinson of Lady Hall, Millom, Cumbria, LA18 5HR says that if anyone cares to send problem programs to him he will try to affect a sort out. Mr Robinson prefers disks but can work with cassettes and asks that sufficient return postage is enclosed. No guarantees but he is willing to have a go. The other reader is E.D. Hughes of 34, Masefield Road, Penarth, South Glamorgan, CF6 1SE who is prepared to make copies of all games and certain other programs that he has typed in. He will let you have a full list of all the games he has typed in from Atari User and other magazines upon receipt of a stamped addressed envelope. He is willing to make copies of whatever games you need for a cost of £1 to cover postage, duplicating lists etc. plus a blank tape.

Way back someone offered a similar service to this through the Contact column and just kept all the money but I am sure, judging from his letter, that Mr Hughes is trustworthy and Mr Robinson has been known to us as a correspondent for many years. The fellow mentioned, one James Stevens, ended up in prison! If you have any problems bear in mind that these two folks could get inundated! Perhaps the parties on both sides would let us know how they get on?

THE SURVEY
WHAT DID IT ALL MEAN?

We've finally finished entering all the information from the survey back in issue 36 and would firstly like to thank all of the 445 readers who took the trouble to fill in the form and send us their views, often with lengthy additional comments and suggestions. Several readers have asked us to publish the results of the survey so here's a summary of the findings.

We split the survey into two sections, for XL/XE and ST, so that answers from one set of users didn't cloud the answers from the other. For instance, Turbo Basic is not available on the ST so every ST owner who asked for less coverage would have distorted the actual response from those who are able to use it. Where appropriate we combined figures to get an overall view.

*First thing to emerge is that **32% of our readers are ST owners**, of which **about half also own 8-bit machines**, and that's quite a high percentage. Next time any 8-bit owner feels like writing to complain about the ST coverage, perhaps they would stop and think. If we lose 32% of our sales and about half of the advertising that would not only ensure there was no ST coverage but also no magazine! Likewise ST owners who ask us to drop the 8-bit should think about the 78% who form the backbone of the magazine.*

*Of the 8-bit owners **71% have disk drives** and **25% are cassette based** (some didn't give this info as they only answered to both ST and 8-bit), so there is obviously a good percentage who still need cassette based programs and articles.*

*What about your preferences? There's not room to give all the details and there are many ways of interpreting things so we'll just take those that got 'majority' votes. We'll start first with **XL/XE** owners. These folks wanted **MORE Type-in Utilities** (62%), **Serious Reviews** (49%), **Programming articles** (55%), **Tutorials** (46%) and **Hardware Projects** (41%, just a majority). The most overwhelming votes came in the categories that people wanted to stay the **SAME** and these were **News** (62%), **Letters** (62%), **Type-In Games** (47%), **Short Demos** (43%, just beating those who want more), **Hardware Reviews** (47%, again close), **Adventure Column** (44%), **Games Reviews** (55%), **Turbo Basic** (43%), **Interviews** (50%), **First Steps** (49%) and **Contact** (67%).*

*There were no items that receive a majority vote for **LESS** but those that came close included **Type-In Games** (30%), **Adventure Column** (30%) and **Interviews** (35%).*

*Over to the **ST** and the same categories. Here we have **MORE News** (47%, tying with same), **Type-In Utilities** (46%), **Type-In Demos** (42%), **Hardware Reviews** (50%), **Serious Reviews** (61%), **Programming Articles** (61%), **Tutorials** (45%) and **Hardware Projects** (39%, fairly evenly split). Those of you that wanted the **SAME** were **Letters** (64%), **Adventure Column** (33%, another close one), **Games Reviews** (48%), **Turbo Basic** (45%), **Interviews** (43%), **First Steps** (45%) and **Contact** (60%). There were more votes for **LESS** amongst ST users with a majority wanting **LESS Type-In Games** (45%) and high percentages for less **Type-In Utilities**, **Type-In Demos**, **Adventure Column**, **Games Reviews**, **Hardware Projects**, **Turbo Basic** and **Interviews**. The votes on the ST were much more widely spread overall giving some idea of the difficulty of covering this machine. One interesting thing was that a majority want to keep the same coverage on Turbo Basic and it's not available on the ST! What's more two people actually asked for more!*

***Listings in the mag**? Quite evenly split, with **52% wanting them in the magazine** and **48% wanting them on disk**. Almost all the cassette owners pointed out that they would lose out if the listings were not in the magazine. Fair point.*

*A **Top Twenty**? Close again **55%** saying **NO** and **42%** saying **YES** (some didn't vote), so this is a close decision, do we or don't we?*

*The votes about having more or less coverage of each machine were fairly predictably in favour of whatever machine the reader owned except for the lone ST owner who stated that there should be NO ST coverage! What was more interesting was that **69% read both sections of the magazine**, whichever machine they own, and the vote was exactly the same for both sets of users.*

*The most overwhelming response was whether you want a regular column covering the **Public Domain** scene with over **90% of both XL/XE and ST owners wanting one**. This is something we are quite keen on and we already have one possible writer lined up but would welcome some other contributors. We would need one contributor covering 8-bit and one covering the ST. You have to be a good, interesting writer and be able to write a column of about 800 words each issue. Send us a sample review if you want to have a go. We don't want professional journalists here, (you won't paid much!) but people who love their Atari and can write. We can supply lots of PD software for future columns if you become our regular PD writer.*

*That's about it really except to note that the **actual readership** of the magazine came out at **169% of those that buy** it i.e. if we sell 20,000 then 33,800 read the magazine. If those extra 13,800 would also buy a copy we could put in a load of extra pages to keep everyone happy!*

HOW TO TYPE IN THE LISTINGS
and get them right!

The program listings in NEW ATARI USER are prepared carefully to ensure that they can be typed in as easily as possible. Before typing any listings ensure that you are familiar with the use of the Shift and CONTROL and INVERSE keys as outlined in your computer manual. The listings are prepared to match exactly what you see on screen. Every character that you may see in a listing is included in the chart below for cross reference. By using TYPO 3 you can ensure that you type in the programs EXACTLY as they are printed. Remember, a single typing mistake may mean a program will not run.

WHAT ARE THOSE CODES?

Each line of a program printed in NEW ATARI USER begins with a special two letter code. THESE SHOULD NOT BE TYPED IN. They are used by the program TYPO to check that you have typed each line correctly. IF YOU HAVE NOT ALREADY TYPED IN THE TYPO 3 LISTING PLEASE DO SO NOW. The program can be used as you type in each line of a program or to check an already typed program. The code for each line will match but if you have problems check the listing conventions below carefully, you are most probably typing a CONTROL character incorrectly. TYPO 3 cannot check whether a line has been missed so if you have problems in running a listing count the lines in the program and ensure none are missing. If the TYPO codes match and the program still does not run, LIST it to cassette or disk using LIST "C:" or LIST "D:filename", switch off the computer, re-boot and then ENTER the program using ENTER "C:" or ENTER "D:filename". Save this version in the normal way.

HOW TO USE TYPO 3

1. Type in the listing carefully for although you can use TYPO 3 to check itself (see 6 below) it may not work if you have made mistakes.

2. SAVE or CSAVE a copy of the program.

3. Each time you want to type in a program listing RUN TYPO 3 first. The program will install a machine code routine in memory and then delete itself. Now type in a line as shown in the magazine *excluding the first two letter code* and press RETURN.

4. A two letter code will appear at the top left of your screen. If this code matches the one in the magazine carry on and type the next line. Note, the code will not match if you use abbreviations. If you prefer to use abbreviations LIST the line you have just typed, move the cursor to that line and press RETURN. The code should now match.

5. If the code does not match, use the editing keys to correct the line and press RETURN again. Repeat if necessary until the codes match.

6. To check a line you have already typed LIST the line, place the cursor on that line and press RETURN.

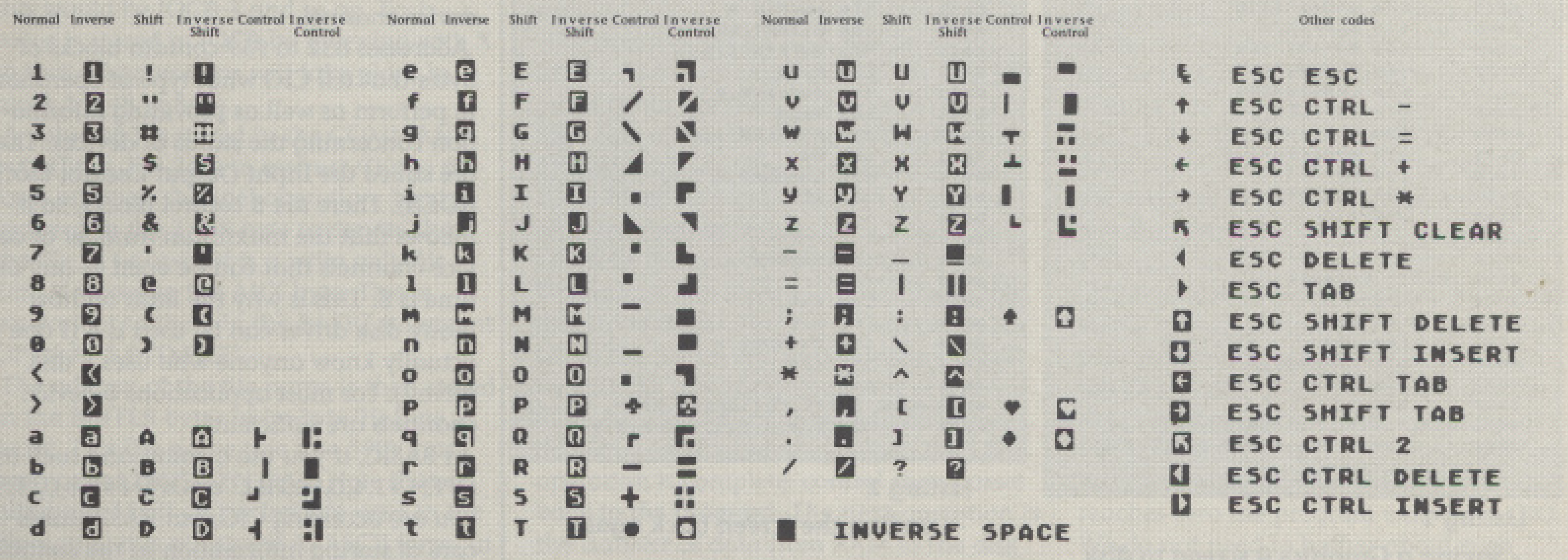
7. When you have finished a listing just SAVE or CSAVE it in the normal way.

You can type in a program without using TYPO 3 and then check it by SAVEing or CSAVEing a copy of the program, running TYPO 3 and then LOADing or CLOADing your program and proceeding as in step 6 above.

Always SAVE or CSAVE a program before running it and always use TYPO before telling us that a program will not run.

OUR UNIQUE LINE BY LINE CHECKER WORKS ON ALL ATARI XL/XE and earlier 8-bit machines

```
EI 1 REM ********************************
AL 2 REM *  TYPO III by Alec Benson     *
         *          June 1985           *
SA 3 REM * A proofreader for ANTIC and *
         *   PAGE 6 based on TYPO II    *
         * published by ANTIC magazine *
EL 4 REM ********************************
SG 100 GRAPHICS 0
WG 110 FOR I=1536 TO 1791:READ A:CK=CK+A:
   POKE I,A:NEXT I
CG 120 IF CK<>30765 THEN ? "Error in DATA
    statements - Check Typing":END
YM 130 A=USR(1536)
VT 140 ? :? "TYPO III is up and running":
   NEW
MA 1000 DATA 104,160,0,185,26,3,201,69
HG 1010 DATA 240,8,200,200,200,192,36,208
QB 1020 DATA 242,96,200,169,79,153,26,3
RK 1030 DATA 200,169,6,153,26,3,162,0
RR 1040 DATA 189,0,228,157,79,6,232,224
TO 1050 DATA 15,208,245,169,93,141,83,6
KC 1060 DATA 169,6,141,84,6,173,4,228
EU 1070 DATA 105,0,141,95,6,173,5,228
BK 1080 DATA 105,0,141,96,6,169,0,162
KK 1090 DATA 3,149,203,202,16,251,96,0
ZR 1100 DATA 0,0,0,0,0,0,0,0
LD 1110 DATA 0,0,0,0,0,0,32,94
JM 1120 DATA 6,8,72,201,155,240,55,230
TV 1130 DATA 203,133,209,138,72,169,0,133
TW 1140 DATA 208,162,8,10,38,208,6,209
MF 1150 DATA 144,7,24,101,203,144,2,230
RL 1160 DATA 208,202,208,239,133,207,24,1
   65
TM 1170 DATA 204,101,207,133,204,165,205,
   101
AW 1180 DATA 208,133,205,165,206,105,0,13
   3
XH 1190 DATA 206,104,170,104,40,96,138,72
NR 1200 DATA 152,72,162,0,134,207,134,208
GF 1210 DATA 160,24,6,204,38,205,38,206
EA 1220 DATA 38,207,38,208,56,165,207,233
TM 1230 DATA 164,170,165,208,233,2,144,4
SK 1240 DATA 134,207,133,208,136,208,227,
   162
CB 1250 DATA 8,165,207,133,204,165,208,6
XN 1260 DATA 204,42,201,26,144,4,233,26
MB 1270 DATA 230,204,202,208,242,133,205,
   169
BC 1280 DATA 128,145,88,200,192,40,208,24
   9
WV 1290 DATA 165,204,105,160,160,3,145,88
QA 1300 DATA 165,205,24,105,161,200,145,8
   8
MQ 1310 DATA 32,69,6,104,168,76,153,6
```



MACHINE CODE LIBRARY

In the second article of this series Stephen Williamson provides routines for saving and loading memory

```
10 ;MACHINE CODE LIBRARAY
20 ;by Stephen Williamson
30 ;for PAGE 6/ATARI USER
40 ;-----------------------
50 ;#2.1 SAVE MEMORY BLOCK
60 ;TO DISK
70 ;-----------------------
80        *=  20000
90        .OPT OBJ
0100 CIO =   58454
0110 COMMAND = 834
0120 BUFFER = 836
0130 BUFFLEN = 840
0140 AUX =   843
0150 TASK =  842
0160 START = 40000
0170 LENGTH = 960
0180 ;
0190 ;--------------------
0200 ;OPEN DEVICE CHANNEL
0210 ;--------------------
0220      LDX #16
0230      LDA #3      3=Open channel
0240      STA COMMAND,X
0250      LDA #8      8=Write
0260      STA TASK,X
0270      LDA #0
0280      STA AUX,X
0290      LDA #NAME&255
0300      STA BUFFER,X
0310      LDA #NAME/256
0320      STA BUFFER+1,X
0330      JSR CIO
0340 ;
0350 ;---------
0360 ;SAVE DATA
0370 ;---------
0380      LDX #16
0390      LDA #START&255
0400      STA BUFFER,X
0410      LDA #START/256
0420      STA BUFFER+1,X
0430      LDA LENGTH&255
0440      STA BUFFLEN,X
0450      LDA LENGTH/256
0460      STA BUFFLEN+1,X
0470      LDA #8
0480      STA COMMAND,X
0490      JSR CIO
0500 ;
0510 ;-------------
0520 ;CLOSE CHANNEL
0530 ;-------------
0540      LDX #16
0550      LDA #12     12=Close
0560      STA COMMAND,X
0570      JSR CIO
0580      RTS
0590 NAME .BYTE "D:SCREEN.DAT"
0600      .BYTE 0.0.0.0.0.0.0.0.0.0
```

Listing 1
- Saving a Graphics 0 screen to disk

```
10 ;MACHINE CODE LIBRARAY
20 ;by Stephen Williamson
30 ;for PAGE 6
40 ;-----------------------
50 ;#2.2 LOAD MEMORY BLOCK
60 ;FROM DISK
70 ;-----------------------
80        *=  20000
90        .OPT OBJ
0100 CIO =   58454
0110 COMMAND = 834
0120 BUFFER = 836
0130 BUFFLEN = 840
0140 AUX =   843
0150 TASK =  842
0160 START = 40000
0170 ;
0180 ;--------------------
0190 ;OPEN DEVICE CHANNEL
0200 ;--------------------
0210      LDX #16
0220      LDA #3      3=Open channel
0230      STA COMMAND,X
0240      LDA #4      4=Read
0250      STA TASK,X
0260      LDA #0
0270      STA AUX,X
0280      LDA #NAME&255
0290      STA BUFFER,X
0300      LDA #NAME/256
0310      STA BUFFER+1,X
0320      JSR CIO
0330 ;
0340 ;---------
0350 ;LOAD DATA
0360 ;---------
0370      LDX #16
0380      LDA #START&255
0390      STA BUFFER,X
0400      LDA #START/256
0410      STA BUFFER+1,X
0420      LDA #255
0430      STA BUFFLEN,X
0440      LDA #255
0450      STA BUFFLEN+1,X
0460      LDA #4
0470      STA COMMAND,X
0480      JSR CIO
0490 ;
0500 ;-------------
0510 ;CLOSE CHANNEL
0520 ;-------------
0530      LDX #16
0540      LDA #12     12=Close
0550      STA COMMAND,X
0560      JSR CIO
0570      RTS
0580 NAME .BYTE "D:SCREEN.DAT"
0590      .BYTE 0,0,0,0,0,0,0,0,0,0
```

Listing 2
- Loading the screen back again

In the last issue I demonstrated how to move and clear blocks of memory. This issue I will show you how to save and load parts of memory to disk or cassette. The source code listings that make up the machine code library can be entered using most Atari assemblers such as the Atari Assembler Editor or MAC/65.

To save and load data is fairly straightforward in machine code as the Atari operating system contains routines that take care of transferring data between the computer and peripherals. This system is known as the Central Input/Output system (CIO). A detailed description of CIO would take up several articles, and is not necessary in order to use the machine code library subroutines in your own applications, but a brief summary will help to understand how the routines work.

HOW CIO WORKS

CIO controls all the data transfer between a device and the computer. A device can be one of several types including disk drive, cassette, printer or RS232 device (such as the Atari 850 interface). Even the keyboard and screen are treated as devices. The line of communication between the computer and a device is known as a device channel.

Addresses 832 to 959 contain blocks of bytes that tell CIO what type of operations to perform as well as providing information concerning the status of devices. These are called the Input Output Control Blocks (IOCB). There are 8 control blocks, so it follows that the maximum number of device channels that can be open at any one time is 8. This is why the limit on how many disk drives can be used is 8 (I don't actually know anyone who uses 8 disk drives!). For most applications 8 device channels are sufficient.

In BASIC, if you use a command such as OPEN #1,4,0,"D:FILE" or OPEN #2,8,0,"K:" you are accessing CIO, but BASIC takes care of storing information in the control blocks. In machine code we must give

IOCB more information. Each input/output block consists of 16 bytes. The first block (832-847) is known as block 0 and is normally used for the screen editor (E:). IOCB 6 is automatically assigned to the screen (S:) on graphic screens other than mode zero. This is why, when printing to a graphics 1 or 2 screen, the PRINT #6 statement is used in BASIC to display large text onto the screen display. Whenever you use the BASIC command LPRINT, IOCB 7 is automatically allocated to the printer by the operating system.

When using the disk drive or cassette it is best to use only blocks 1 to 5, in order to avoid any conflict. In most cases you will only need to use one device at a time - so I tend to stick to block 1 (848 - 863).

SAVING MEMORY

Listing 1 is a routine to save a block of memory to a disk file. Although there are 16 bytes in each IOCB, life is made simpler by the fact that we need only use 5 of them to perform the save operation. For reference Table 1 contains a list of what each of the 16 bytes in a control block is used for.

The first part of Listing 1 (lines 220 to 330) opens a device channel from the computer to the disk drive. This is equivalent to the BASIC statement OPEN #1,8,0,"D:FILE". To do this in machine code we need to store various values in IOCB to tell CIO what type of operation we wish to perform.

Firstly the X register is loaded with 16 (lines 230 and 240). The CIO system uses the value held in the X register to decide which channel to operate on. In the BASIC statement #1 is used to designate the block, but in machine code the X register must be loaded with either 0 (for block zero) or a multiple of 16 to fix the start of the IOCB. A value of 16 instructs CIO to use channel 1. If X was 32 then we would be dealing with IOCB 2. If X was 48 then this would be IOCB 3 and so on. Each value is stored in IOCB by indexing with X so that all operations will take place in block 1 (848 to 863).

A value of 3 is stored in the COMMAND byte (lines 230-240) to instruct CIO to perform an open channel operation. Next, 8 is stored in the TASK byte to denote that the file to be opened is a write only file. Zero is stored in the AUX byte. This is equivalent to the 0 in the BASIC statement OPEN #1,8,0 "D:FILE".

The address of the file name is then stored in the BUFFER bytes in Lo-byte/Hi-Byte order. This file name (see line 590), has been called D:SCREEN.DAT. Note that, although ASCII characters are used in the file name, it is not stored in ASCII form. In the case of the MAC65 cartridge the .BYTE directive and not the .SBYTE directive is used.

The access point for CIO is at location 58454. The instruction JSR CIO at line 330 sends control to the CIO routines which take care of the rest of the OPEN routine. The information that was placed in the IOCB block tells CIO what operations we required and the value in the X register (16) tells the system which IOCB to use. Operations like starting and stopping the disk drive motor, finding a clear sector to begin the file on etc. are all taken care of by CIO. By including D: as part of the filename CIO knows that channel 1 is a disk drive device channel. When the CIO operation is complete, control then passes back to the program. The next operation is the transfer of data from RAM to the disk file.

```
10 ;MACHINE CODE LIBRARAY
20 ;by Stephen Williamson
30 ;for PAGE 6
40 ;---------------------
50 ;#2.3 SAVE MEMORY BLOCK
60 ;TO CASSETTE
70 ;----------------------
80        *=  20000
90        .OPT OBJ
0100 CIO =    58454
0110 COMMAND = 834
0120 BUFFER = 836
0130 BUFFLEN = 840
0140 AUX =    843
0150 TASK =   842
0160 START = 40000
0170 LENGTH = 960
0180 ;
0190 ;-------------------
0200 ;OPEN DEVICE CHANNEL
0210 ;-------------------
0220      LDX #16
0230      LDA #3      3=Open channel
0240      STA COMMAND,X
0250      LDA #8      8=Write
0260      STA TASK,X
0270      LDA #NAME&255
0280      STA BUFFER,X
0290      LDA #NAME/256
0300      STA BUFFER+1,X
0310      JSR CIO
0320 ;
0330 ;---------
0340 ;SAVE DATA
0350 ;---------
0360      LDX #16
0370      LDA #START&255
0380      STA BUFFER,X
0390      LDA #START/256
0400      STA BUFFER+1,X
0410      LDA #LENGTH&255
0420      STA BUFFLEN,X
0430      LDA #LENGTH/256
0440      STA BUFFLEN+1,X
0450      LDA #8
0460      STA COMMAND,X
0470      LDA #128
0480      STA AUX,X
0490      STA 62
0500      JSR CIO
0510 ;
0520 ;-------------
0530 ;CLOSE CHANNEL
0540 ;-------------
0550      LDX #16
0560      LDA #12      12=Close
0570      STA COMMAND,X
0580      JSR CIO
0590      RTS
0600 NAME .BYTE "C:"
0610      .BYTE 0,0,0,0,0,0,0,0,0,0
```

```
10 ;MACHINE CODE LIBRARAY
20 ;by Stephen Williamson
30 ;for PAGE 6
40 ;----------------------
50 ;#2.4 LOAD MEMORY BLOCK
60 ;FROM CASSETTE
70 ;----------------------
80        *=  20000
90        .OPT OBJ
0100 CIO =    58454
0110 COMMAND = 834
0120 BUFFER = 836
0130 BUFFLEN = 840
0140 AUX =    843
0150 TASK =   842
0160 DEVICE = 833
0170 START = 40000
0180 LENGTH = 960
0190 ;
0200 ;-------------------
0210 ;OPEN DEVICE CHANNEL
0220 ;-------------------
0230      LDX #16
0240      LDA #3      3=Open channel
0250      STA COMMAND,X
0260      LDA #4      4=Read
0270      STA TASK,X
0280      LDA #NAME&255
0290      STA BUFFER,X
0300      LDA #NAME/256
0310      STA BUFFER+1,X
0320      JSR CIO
0330 ;
0340 ;---------
0350 ;LOAD DATA
0360 ;---------
0370      LDX #16
0380      LDA 88
0390      STA BUFFER,X
0400      LDA 89
0410      STA BUFFER+1,X
0420      LDA #255
0430      STA BUFFLEN,X
0440      LDA #255
0450      STA BUFFLEN+1,X
0460      LDA #4
0470      STA COMMAND,X
0480      LDA #128
0490      STA AUX,X
0500      STA 62
0510      LDA #1
0520      STA DEVICE
0530      JSR CIO
0540 ;
0550 ;-------------
0560 ;CLOSE CHANNEL
0570 ;-------------
0580      LDX #16
0590      LDA #12      12=Close
0600      STA COMMAND,X
0610      JSR CIO
0620      RTS
0630 NAME .BYTE "C:"
0640      .BYTE 0,0,0,0,0,0,0,0,0,0
```

Listings 2 and 3 - Saving and loading with cassette

Overleaf - tables 1 and 2 and the listings in BASIC

The X register is again loaded with 16 (lines 380 to 390) and the starting location of the data to be transferred is loaded to the BUFFER in Lo-byte/Hi-Byte order. The routine has designated a value of 40000 for START. This is the start of the screen RAM when in text mode 0. The length of the memory block to be saved is 960 (a text 0 screen is 960 bytes long), see line 170.

A value of 8 for a write operation is next stored in the COMMAND byte and, as in the open routine, control then passes to the CIO system which writes the data to the previously opened file. The value of BUFFLEN is decreased by 1 after each byte has been written to the file and when it reaches zero the program exits from CIO. We do not need to bother about such things as adding to the disk directory or

switching off the disk drive motor when CIO is finished - the CIO routines takes care of all this. Finally the device channel (lines 540 to 580) must be closed by storing a value of 12 in the COMMAND byte (12=close). It is important to close the device channel. If you try to open a channel that is already open then an error will result.

Listing 1 saves whatever is written on a text 0 screen to a disk file, but can be adapted to save any block of memory. To customise the listing alter the values of START and LENGTH (lines 160 and 170) or the filename at line 590.

LOADING MEMORY

Listing 2 is used to load the file into memory. The open device channel routine (lines 210-320) are identical to Listing 1 apart from using a value of 4 (=read) instead of 8 (=write).

To load the data, the starting address of where the data is to be loaded is stored in the BUFFER bytes of IOCB (lines 380 - 410). This does not have to be the same location from where the original data was saved. By storing a value of 255 in both BUFFER bytes (lines 440 to 470), a maximum record length of 65536 (256*256) is set. The exact length of the data file could be specified or a smaller value could be used so that only part of the data is loaded but by setting a maximum length the CIO system loads the file until it reaches an end-of-file marker on the record. This marker was automatically added to the file by the CIO system when saving.

Line 46 tells CIO to perform a load routine and as in listing 1 the final section (lines 540 to 590) close the device channel.

ROUTINES FOR CASSETTE

Listings 3 and 4 are similar to the first two routines, but for cassette. The filename used is "C:"(Listing 3 Line 600). When the CIO finds this as a file name the two beeps are automatically sounded by the CIO system to prompt the user to press PLAY and RECORD on the cassette player. The data is recorded to cassette in bursts or blocks of 128 bytes each. In order to make the gap between each burst short, a value of 128 must be stored at the AUX bytes in IOCB and also in location 62 (see lines 470 to 490). This reduces the length of time taken to save a record.

ERROR TRAPPING

The source code listings will work correctly providing your equipment is OK. But what happens if there is a fault? Maybe the disk drive is not switched on, the disk may be write protected, or the disk may be full. In BASIC whenever such things happen an error number between 128 and 173 is returned. In the routines as they stand any error will result in the program ending without the save or load operation being performed.

BYTE	NAME	USE
0	INDEX	Index to the device name for currently open file. Usually not used
1	DEVICE	Device number e.g 1 for disk, 1 or 2 for disk 2. This is set by the operating system
2	COMMAND	Designates the type of operation. Values that can be used here are shown in Table 2
3	STATUS	Stores status of device. A value found here is equivalent to BASIC error numbers 128 to 173
4/5	BUFFER	two bytes that store the address of the file name or the address where the data is to be transferred to bytes 6/7
6/7	PUT BUFFER	stores address of routine to put one byte. Not used by the Operating system except in BASIC
8/9	BUFFLEN	Sets maximum number of bytes to save or load. This address decreases by 1 each time a read or write operation is performed, so BUFFLEN can be used to check on how many bytes have been transferred
10	TASK	Used to specify type of file. Values stored here include 4=Read, 8=Write, 6=Read disk directory, 9=append to old disk file, 12=read and write
11	AUX	The value held here depends on which device is being used
12,13	AUX3/4	Stores current disk sector number when using BASIC command NOTE and POINT
14	AUX5	Stores current within a sector when using NOTE and POINT
16	AUX 6	Spare auxiliary byte

TABLE 1 - BYTES USED IN EACH CONTROL BLOCK

MACHINE CODE L

An error trapping routine would be useful. By examining the STATUS byte (byte 3) of the IOCB, we can find the type of error that has occurred. The number found there will be the equivalent of the BASIC program error number (see the Atari owners manual for a list of error types). Errors can occur at more than one point. After trying to open a write-only file errors such as write protected disk or device timeouts may occur. When attempting to save the data the disk may be full, or the device may become disconnected. When loading data, especially from tape, errors occur when the expected number of bytes in a block does not reach the computer due to tape error, dirty heads etc.

A typical error trapping routine is

```
LDA STATUS,X
CMP #0
BNE ERROR
```

which is written after an open operation and after a save or load attempt.

In this example, whenever an error occurs, an ERROR routine would display an error message on the screen. I have not included error trapping routines in the listings as it is impossible to provide a routine to suit all applications. The type of routine needed depends on many factors - what type of error message is needed? What graphic screen is the message to be displayed on? What message do you wish to display?

THE ROUTINES IN BASIC

Listings 5 and 6 save and load memory blocks from BASIC. When using the CIO from BASIC, a full implementation of listings 1 to 4 is not necessary as the machine code routines would not save any significant memory or work much faster.

The only machine code that is needed is a short routine to access the CIO. The data for this is found in line 270 of listing 5. In assembly language this reads:

```
PLA
LDX #16
JSR 58454 (CIO)
RTS
```

If using a channel other than 1 then alter the value of 16 to another multiple of 16 in line 270 (or line 230 in listing 6).

```
QK 1 REM ****************************
ZD 2 REM *    MACHINE CODE LIBRARY 2  *
XQ 3 REM *      (LOAD MEMORY BLOCK)   *
ZC 4 REM *             by             *
QV 5 REM *       Steve Williamson     *
JA 6 REM * -------------------------- *
RL 7 REM * PAGE 6 MAGAZINE - ENGLAND *
QR 8 REM ****************************
NO 9 REM
GF 40 GRAPHICS 0:SETCOLOR 2,0,0:SETCOLOR
   4,0,4
RR 50 GOSUB 180
AC 60 OPEN #1,4,0,"D:SCREEN.DAT"
AZ 70 REM CASSETTE USERS TYPE:- 60 OPEN #
   1,4,0,"C:":POKE 859,128:POKE 62,128
AV 80 START=40000
JY 90 HISTART=INT(START/256)
DR 100 LOSTART=START-HISTART*256
OH 110 POKE BUFFER,LOSTART
HG 120 POKE BUFFER+1,HISTART
AC 130 POKE BUFLEN,255:POKE BUFLEN+1,255
IF 140 POKE CMD,4
LE 150 A=USR(ADR(MC$)):CLOSE #1
OG 160 GOTO 160
AQ 170 REM LOAD MEMORY BLOCK
VP 180 BUFFER=852:BUFLEN=856
IB 190 AUX=859:TASK=859:CMD=850
CS 200 DIM MC$(10)
FZ 210 FOR I=1 TO 7:READ A:MC$(I,I)=CHR$(
   A)
MM 220 NEXT I:RETURN
XQ 230 DATA 104,162,16,76,86,228,96
```

```
QK 1 REM ****************************
ZD 2 REM *    MACHINE CODE LIBRARY 2  *
GI 3 REM *      (SAVE MEMORY BLOCK)   *
ZC 4 REM *             by             *
QV 5 REM *       Steve Williamson     *
JA 6 REM * -------------------------- *
RL 7 REM * PAGE 6 MAGAZINE - ENGLAND *
QR 8 REM ****************************
NO 9 REM
SB 50 GOSUB 280
PO 60 GOSUB 220
BZ 70 OPEN #1,8,0,"D:SCREEN.DAT"
IM 80 REM CASSETTE USERS TYPE:- 70 OPEN #
   1,8,0,"C:":POKE 859,128:POKE 62,128
AW 90 START=40000
WY 100 HISTART=INT(START/256)
DT 110 LOSTART=START-HISTART*256
OJ 120 POKE BUFFER,LOSTART
HI 130 POKE BUFFER+1,HISTART
RM 140 LENGTH=960
QK 150 HILENGTH=INT(LENGTH/256)
IZ 160 LOLENGTH=LENGTH-HILENGTH*256
KI 170 POKE BUFFLEN,LOLENGTH:POKE BUFFLEN
   +1,HILENGTH
KR 180 POKE CMD,8
LM 190 A=USR(ADR(MC$)):CLOSE #1
LR 200 GOTO 200
GP 210 REM SAVE MEMORY BLOCK
LN 220 BUFFER=852:BUFFLEN=856
HQ 230 AUX=859:TASK=859:CMD=850
DA 240 DIM MC$(10)
GH 250 FOR I=1 TO 7:READ A:MC$(I,I)=CHR$(
   A)
MU 260 NEXT I:RETURN
XY 270 DATA 104,162,16,76,86,228,96
JP 280 GRAPHICS 0:SETCOLOR 2,0,0
BO 290 ? "ENTER TEXT, PRESS RETURN WHEN F
   INISHED"
PC 300 OPEN #1,4,0,"K:"
AE 310 GET #1,A:GRAPHICS 0:SETCOLOR 2,0,0
   :SETCOLOR 4,0,4
YO 320 POKE 82,0:POSITION 0,0:? CHR$(A);
UD 330 GET #1,A:IF A=155 THEN CLOSE #1:RE
   TURN
PR 340 ? CHR$(A);:GOTO 330
```

Listings 5 and 6 - routines in BASIC

Left - Loading from disk or cassette

Above - Saving to disk or cassette

LIBRARY

In listing 5, the save routine, the open channel routine is found at line 70. Cassette users replace this line with the statement after the REM command in line 80 (in listing 6 this is at line 70). Values are stored in IOCB using POKE commands. Because we are using channel 1 the relevant IOCB block is 848 to 863. Each appropriate byte in the input/output block is allocated to a variable to make the program easier to follow. Lines 60 to 270 contain standard routines for saving a block of data. To customise the routine all you need to do is alter the value of START (line 90) and LENGTH (line 140) to equal the START of the memory area to be saved and the number of bytes to be stored.

As an example of how the save routines can be used, lines 280 to 340 is a subroutine for putting text onto the screen. Text can be placed anywhere (using the cursor keys) or graphic symbols (using CONTROL/key) can also be displayed. Press RETURN to save the contents of the screen to cassette file or disk.

Listing 6 is used to load a file. Alter line 80 to change the area of RAM to transfer the data to.

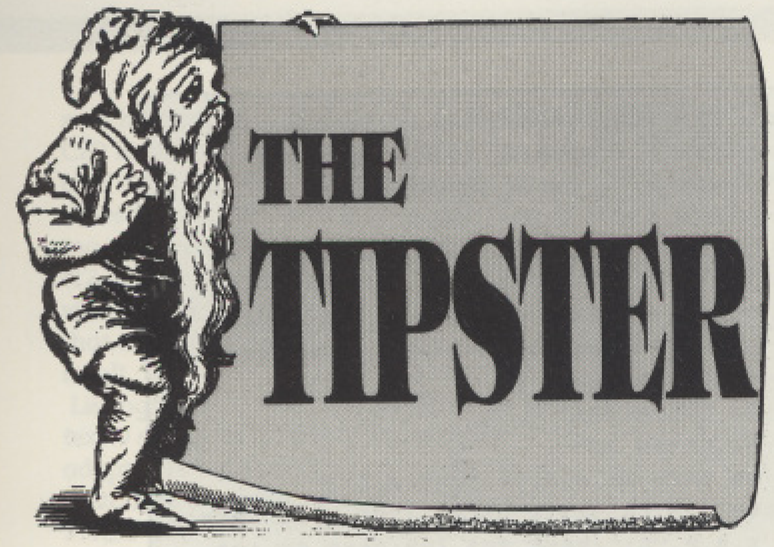
POSSIBLE USES

There are many uses for these routines both in machine code and BASIC. Graphic screens can be saved in drawing programs. In BASIC adventure games a save game feature can be incorporated by storing all the variables and their values. In arcade games different screens can be saved and loaded. The routines demonstrate how to work with the CIO system. Other devices such as the printer or keyboard can be controlled by similar routines.

Next issue we'll take a look at Player Missile Graphics in machine code. See you then. ●

3	**Open channel**
5	**Get text record**
7	**Get binary record**
11	**Put binary record**
12	**Close channel**
13	**Channel status**
32	**Rename disk file**
33	**Delete disk file**
35	**Lock disk file**
36	**Unlock disk file**
37	**Point**
38	**Note**
254	**Format disk**
17	**Draw line**
18	**Fill area**

TABLE 2 - POSSIBLE VALUES FOR BYTE 2 IN CIO BLOCK



Are you stuck?

Hi, I'm the Tipster, here to help you out with all those little problems you have with Atari software, like when you get stuck! Although I'll throw in a few hints and tips of my own, this column is really yours and will be packed with all YOUR original tips, hints, cheats, tricks, maps and playing guides for Atari specific entertainment software covering arcade, adventure, strategy, music, simulations and wargames. It's a two-way affair so if you need help let us know and we'll do our utmost to provide the answers or put out an 'all-gamers bulletin' right here!

If you have any information that will assist other Atari folk, and you wish to see your name in print, then send it on in! We'll be giving special awards to the best contributions received and published and they won't be the usual computer fodder, all sorts of weird and wonderful things will be on offer! Well, that's enough intro, let's get on with helping a few of you out.

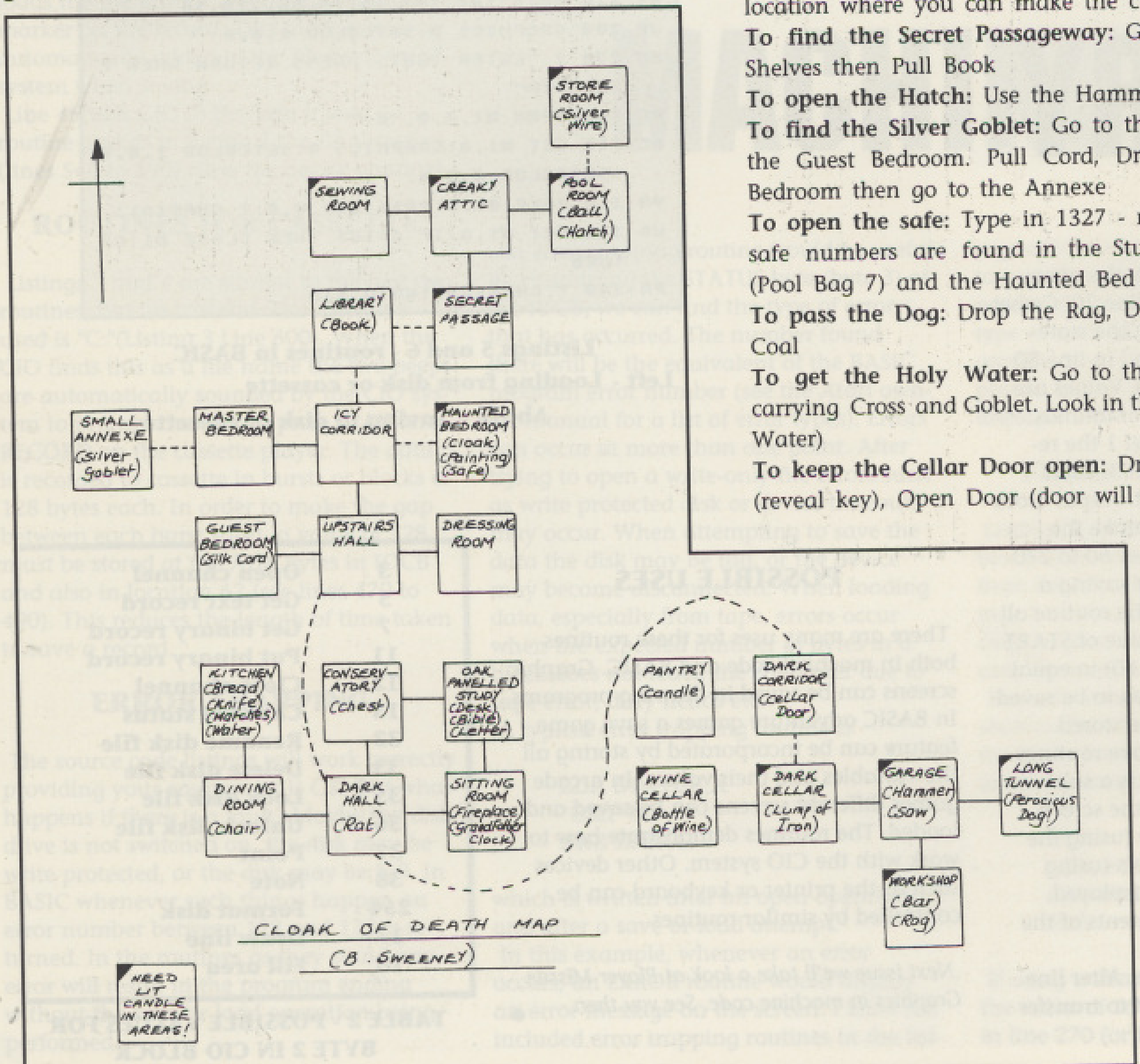
Most of the cries for help received over the past couple of months have been for CLOAK OF DEATH which many of you have tried as your first taste of Atari adventuring so our first set of hints and a map comes from Brian Sweeney of Preston. Let's hope this little lot will get you a bit further on. You've even got a map so you can't get lost but if there are still some of you wandering around we'll try and publish a full solution to this oldie, later on in this column.

CLOAK OF DEATH

To pass the Rat: Carry knife
To go upstairs: Carry the Bible
To open the Chest: Kick Chest (reveal a key)
To make Cross: Get Hammer. Remove nails from hatch. Get wire, and saw Go to the Workshop and Cut Bar. This is the only location where you can make the cross!
To find the Secret Passageway: Go to the Library and Look Shelves then Pull Book
To open the Hatch: Use the Hammer
To find the Silver Goblet: Go to the Cellar and get Iron. Go to the Guest Bedroom. Pull Cord, Drop Iron. Go to the Master Bedroom then go to the Annexe
To open the safe: Type in 1327 - no spaces or comma's! The safe numbers are found in the Study (Letter 1-3), Pool Room (Pool Bag 7) and the Haunted Bed (Painting - 2)
To pass the Dog: Drop the Rag, Drop the Coal then Light the Coal
To get the Holy Water: Go to the Kitchen. Be sure you are carrying Cross and Goblet. Look in the Sink. Get the Water (Holy Water)
To keep the Cellar Door open: Drop the Chest, Kick the Chest (reveal key), Open Door (door will now stay open!)
To get into the Haunted Bedroom: You must have the Bible, Silver Goblet (with Holy Water) and the Cross
To kill the Cloak in the Haunted Bedroom: Carry the above items and type 'EXORCISE CLOAK'

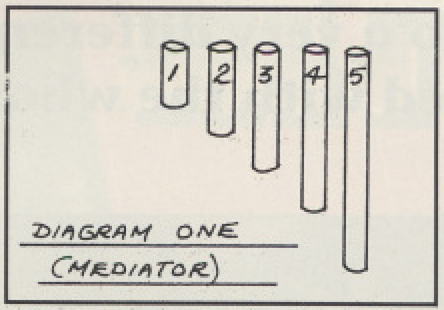
Red Herrings are half-eaten loaf of bread, Grandfather clock, Bottle of Wine, Sewing Room and Dressing Room.

Thanks Brian



Another oldie from the now defunct (as far as Atari goes) English Software is **MEDIATOR** but James Boardman of Stafford has been playing it recently and offers the following hints. You'll need to refer to diagram 1. Are you having trouble killing the robots? Well, after getting the hammer do the following

Robot	First Note	Second Note
Grey	4	2
Yellow	2	5
Pink	5	4
Purple	4	3
Blue	2	3
Green	3	5



Play the notes in sequence!
On the fourth screen, push coals into the pool to evaporate the water, then head for the hidden door.

FLYING AROUND

Anyone do a lot of flying with **FLIGHT SIMULATOR 2**? Christopher Smith of Welling, Kent reckons he's an ace pilot and suggests some fun things to do and has come up with a couple of good tips for this issue.
Have you ever wondered how they got the screen shot on the FS2 box - the Piper Cherokee in the World War 1 setting? Christopher says it's easy, and you can do it too! With accumulated technical know-how (he loaded the WW1 game and checked the options menu?) he discovered the co-ordinates. Load FS2 as normal and go to the parameter option screen and then enter the following:

North position	17404
East Position	7434
Altitude	410

Now return to the simulator and you will be in the 1917 scenario in the Piper, NOT the fighter, and nothing will attack you! You can't bomb either but at least you can fly longer!!
Another thing to try is select New York (La Guardia) and fly to Manhattan Bridge. Those with suicidal tendencies might try flying under the bridge. Great fun, until you crash! Cowards can land by the bridge (on the grass side), line up with it and taxi over onto Manhattan Island. Remember, turn left at the lights and visit Harry's Burger Bar!

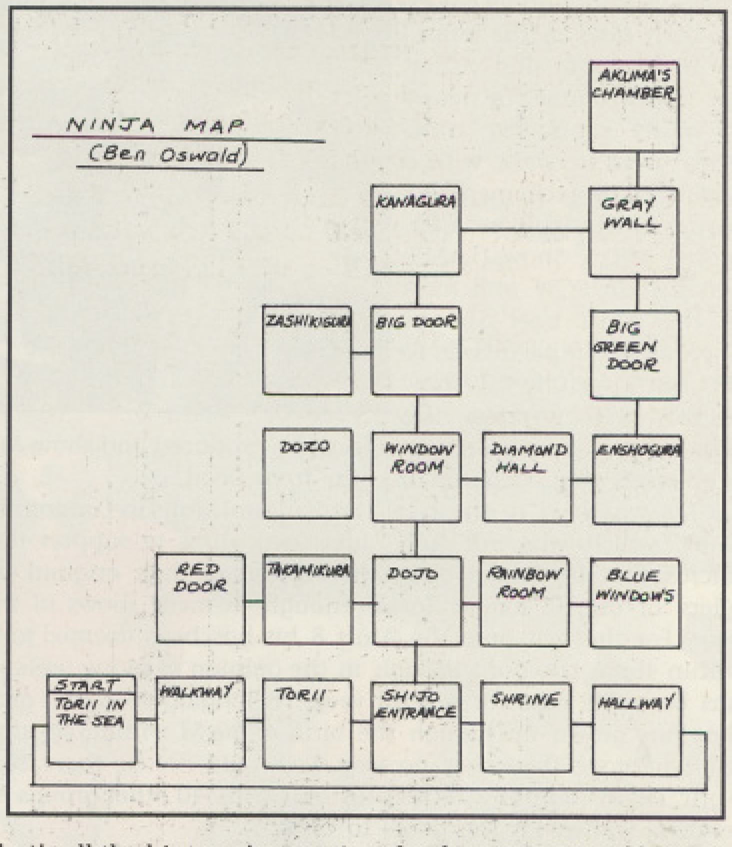
LAS VEGAS CASINO (Zeppelin Games)

A great cheat from Christopher Smith

Bemused by Blackjack? Baffled by Baccarat? Rattled by Roulette? Having difficulty with Craps? Be confused no more! You can break the Bank in about three (yes, THREE!!) 'goes' due to a bug in the Roulette game!
To be a born winner select the odds at evens, put a chip on the EVEN numbers to win and bet ALL your money. Then, still on evens odds, place the remaining chips on the other squares in the evens category. You will not be able to bet any money but move the joystick as if making a bet. You should hear a tone in response to the joystick movement. When you have finished, spin the wheel. You can't lose! When the ball lands, the winning chips will flash and (this is the good bit!) you will win the equivalent as if you had placed all your money on those chips as well. Do this a couple of more times and you will have broken the Bank! Pity this doesn't work in real life!!

NINJA

Ben Oswald from Rathbury, Northumberland fancies himself in the martial arts and has mapped out **NINJA**. Now it's easy to play, just
go around the Palace and collect all 6 Idols, then you will be able to enter Akuma Chamber. Kill all of the men inside and collect the Idol. Go back to the start. The map will help you find your way around the Palace. Good luck!



That's all the hints we've got time for this time around but let's finish up this issue with a couple of pleas for help from fellow Atarians who are stuck fast. Simon Ashley from Redcar wants some help with **DRACONUS**. How do you kill the Tyrant Beast and how do you you get the spells? Also how do you get the Necromancer's Staff?
James Boardman needs some help on **DARK CRYSTAL**, especially the location of Aughra the Mystic and he also needs any help at all with **OPERA HOUSE**.
This is where **YOU** come in. Your answers to the above and hints and tips on all sorts of Atari games may be featured in the next issue so send them in. Individual addresses and telephone numbers will NOT be published unless specifically requested!

This issue's mystery prize (a mystery because we haven't quite decided yet what it's going to be!) goes to Brian Sweeney because his map of Cloak of Death has helped dozens of folks who have written in for help. On offer next time are TWO TICKETS for ALTON TOWERS, worth nearly £20, so you can really reduce yourself to a quivering wreck on the Black Hole, instead of just playing those computer games where you're only pretending!
Drop THE TIPSTER a line at NEW ATARI USER, P.O. Box 54, Stafford, ST16 1DR and help you fellow Atarians out, who knows you may well find the answers to your problems next time! Get those maps and hints coming in! •

LONDON ALTERNATIVE MICRO SHOW

IS THIS THE WAY AHEAD?

Colin Hunt paid a visit to a very different show and came away impressed with the whole thing



I have been attending computer shows, be it major events like PCW or local fayres, for about six years, on both sides of the fence - as an exhibitor and visitor. For the first time, in nearly as many years, I've come away from a show with a real buzz of excitement. So, why was the London Alternative Micro Show (LAMS) better than PCW and most of the Atari User Shows? There is no simple answer to this but hopefully this show review will portray the atmosphere and excitement the show produced and show Atari 8 bit users that their micro is far from dead.

LAMS was held at the New Horticultural Halls in London. The show, which was not fully advertised, aims to support those micros that no longer grace the support of their original suppliers or are no longer 'large' enough to merit shows of their own. For the first time the Atari 8 bit has been deemed to fall within these criterion, though in the opinion of many users this has been the case for several years. Belonging to a user group that has grown up though the birth of the ST without losing its 8 bit heritage there was no way we would not be there, so on April 1st we dutifully turned up and with 40 other groups and retailers waited for the doors to open.

During the seven hours the show was open about 2,000 people, from all walks of life, wandered around the hall talking to the exhibitors behind their 12ft trellis tables. No fancy hyped up displays here, just dedicated users of micros.

The exhibitors of major interest were of course those who were supporting the Atari 8 bit. These included Callisto Computers, Capri Marketing, Computerhouse, Frontier Software and the Bournemouth and Poole Atari User Group. Computerhouse were selling a large range of 8 bit software which they have recently imported from the USA and there were many other games that have not been available in this country for a long time. Frontier Software were selling their usual range of ICD/OSS products and had on display the new SpartaDos X cartridge, although they only had one copy! Also, among the items available, were the P:R: Connection interface, the programming languages Action and BASIC XL, and a great slimline modem, the SupraModem 2400 from Supra Corporation in the USA.

The only other dedicated Atari stand was ours. Along with the latest issue of 8:16, our newsletter, we had a disk of The 8 bit Mouse, which has been written by members of our group. The disk includes a program called TBM Draw which allows you to produce drawings using the ST mouse on your 8 bit computer. In response to many requests at the last Atari User Show we launched the Atari User's Register. The aim of the register is to get Atari users talking to and helping each other and ultimately setting up local groups in areas where groups do not exist.

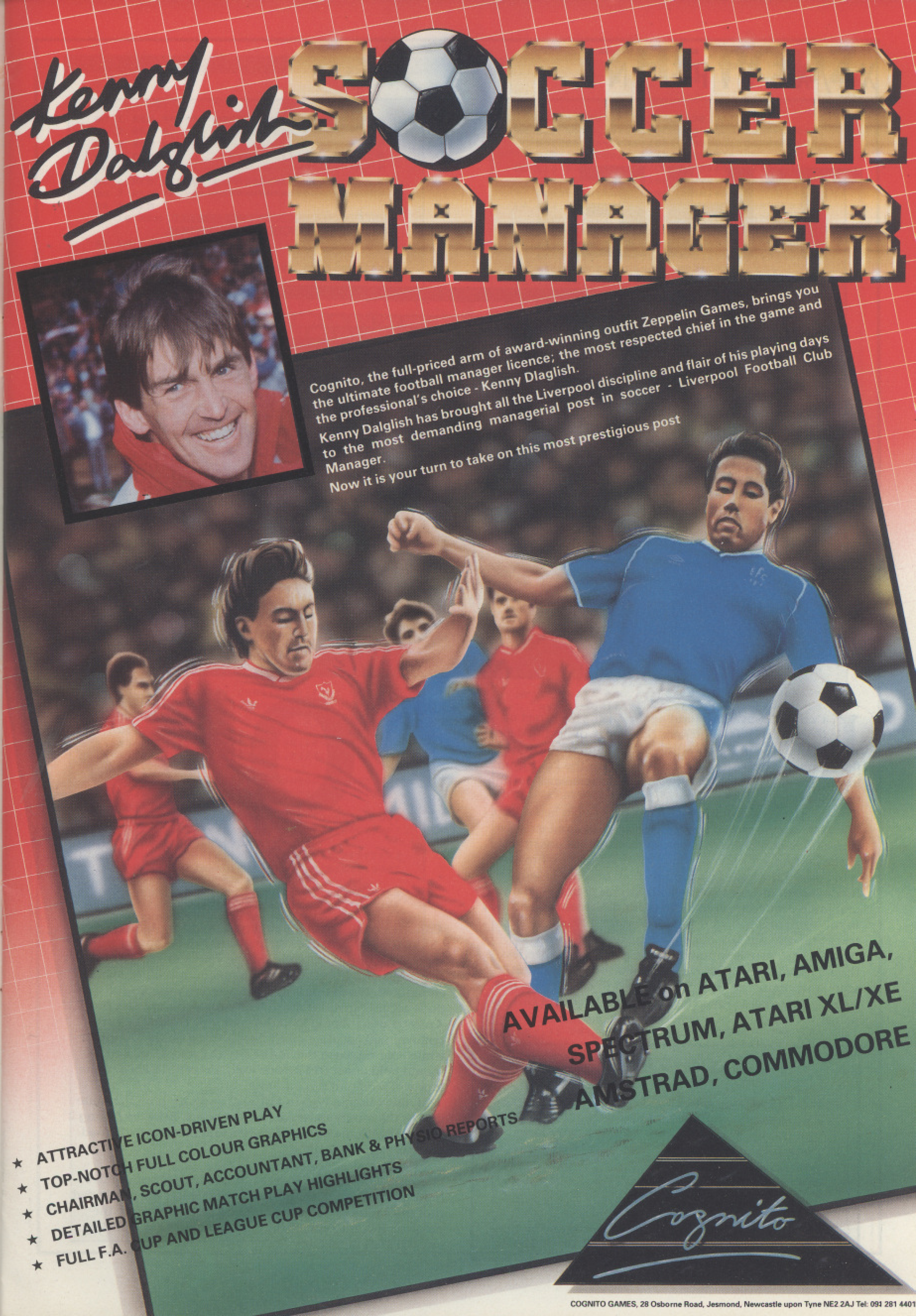
The stands mentioned made the show well worth a visit but on top of this excellent support there was also the pleasure in seeing how other groups of 'unsupported' micros have overcome their supply problems. The Atari 8 bit is still available in the shops, even though it is currently being sold as a games console, yet it does not get the after sales support it deserves, although there is always the possibility on the horizon. Because of this Atari user groups tend to wait and go without, an attitude that will have to change. The other user groups at the show, supporting micros such as the MSX 1 and 2, QL, Adam, Einstein, Jupiter ACE, Lynx, Enterprise, TI99 and Oric, have been through this period of no mans land and are supporting their micros in the way we all wish Atari would support ours. Seeing how these user groups for dead, yet still alive, micros have overcome their difficulties should be an inspiration to us all.

Stands of particular interest included the one manned by the Reading Lynx User Group. Along with their neat sweat shirts they also had on display a CP/M for the 96K Lynx, written by members of the group, a task even Camputers failed on. Both the Einstein user groups at the show produce a monthly magazine and the UK Einstein User Group, which claims 1000 members, also organise the National Einstein Exhibition, which this year was held at the National Motorcycle Museum in Birmingham. The Jupiter Ace User Group operated an open invitation to the other micros, to a head to head race running the PCW benchmark tests. Sadly no one was brave enough to take up the challenge, thus removing the opportunity of the group to show how fast Forth on the ACE is.

Another well supported micro was the TI99/4A which was represented by three user groups and one retailer. One of the user groups, Dorset TI Group (DORTIG), had a standard TI99 with a full expansion box. This included a disk drive interface, serial card and a battery backed RAM disk. The unit also had an 80 column card plugged into the side. An interesting point, especially after the release of SpartaDOS X, was the DOS which is run from a ROM cartridge, which was also battery backed.

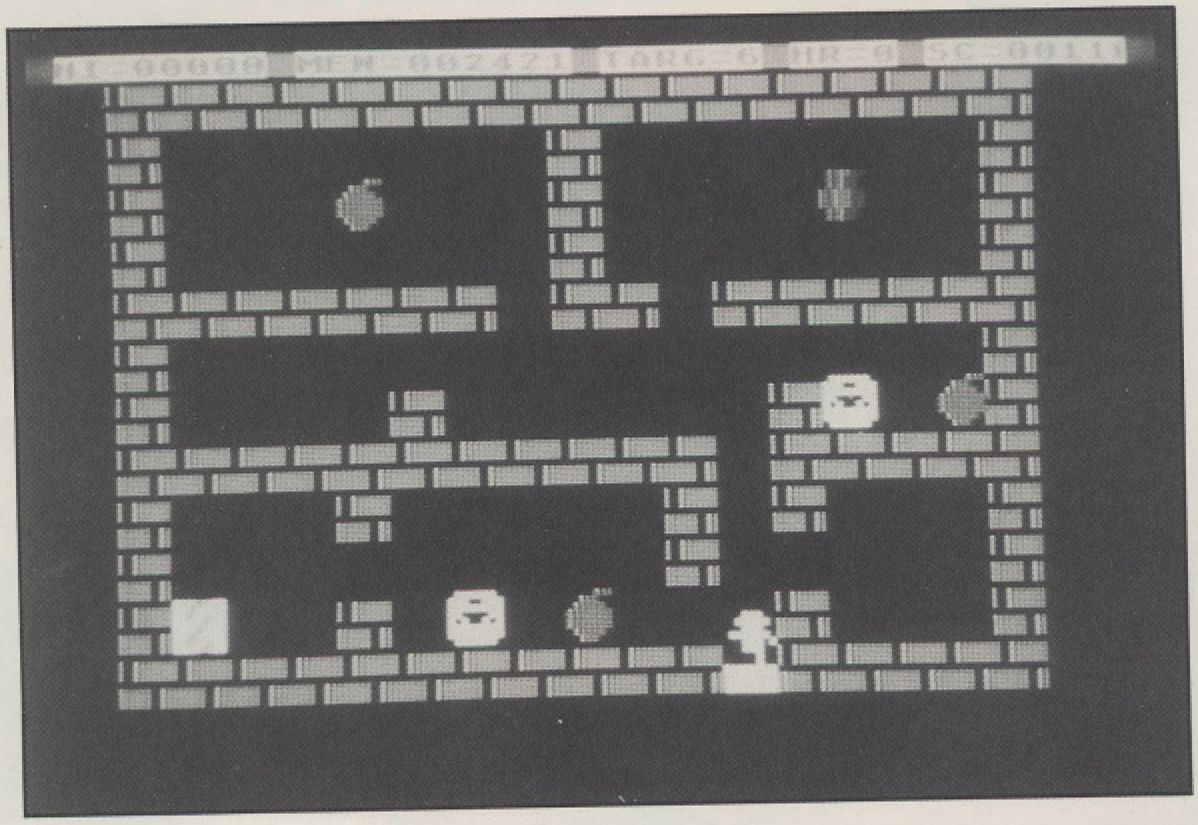
All in all, the London Alternative Micro Show was well worth the visit for those Atari 8 bit users that attended. We were surprised at the large number of 8 bit users, who, as well as attending the show, still believe that the Atari 8 bit is the best micro available. There is no reason why support for Atari at the next show, to be held at the Bingley Hall, Stafford on Saturday 11th November, should not exceed the QL support at this show. The main reason why we should support this show is that the Atari User Shows are now dominated by the ST let's see you there whether you are a retailer or a user.

Do you believe there should be an Atari 8 bit show? If yes, where would be the best place to hold it, London or Birmingham? How much would you pay to get in? Send us your views and if there is enough interest we will organise one. Write to Colin Hunt, Bournemouth and Poole Atari User Group, 248 Wimborne Road, Oakdale, Poole, Dorset BH15 3EF



Kenny Dalglish
SOCCER MANAGER
Cognito, the full-priced arm of award-winning outfit Zeppelin Games, brings you the ultimate football manager licence; the most respected chief in the game and the professional's choice - Kenny Dlaglish.
Kenny Dalglish has brought all the Liverpool discipline and flair of his playing days to the most demanding managerial post in soccer - Liverpool Football Club Manager.
Now it is your turn to take on this most prestigious post
AVAILABLE on ATARI, AMIGA, SPECTRUM, ATARI XL/XE AMSTRAD, COMMODORE
★ ATTRACTIVE ICON-DRIVEN PLAY
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★ DETAILED GRAPHIC MATCH PLAY HIGHLIGHTS
★ FULL F.A. CUP AND LEAGUE CUP COMPETITION
Cognito
COGNITO GAMES, 28 Osborne Road, Jesmond, Newcastle upon Tyne NE2 2AJ Tel: 091 281 4401

THE PODZ



by Bill Halsall

It's time to save the world again. Well, your street at least! Alien bodysnatchers, the 'Podz', are being deposited in the houses, waiting to take human form when the occupants fall asleep. You must prevent the Podz from taking over by keeping your neighbours awake and putting the Podz down the disposal unit.

To waken people touch them whilst they are in bed asleep. The Podz can be picked up by touching them and must be transported quickly to the disposal units which are situated in the bottom left room of each house. Whilst you are carrying one of the Podz you can't pick up another or leave the house. When fully grown the Podz kill off their host humans and jump around from room to room. They cannot be killed in this form and will stun you on contact. Hitting the pod truck will also put you out of commission for a while.

There are 20 people to save and the game ends when less than 3 remain. The display at the top shows the highest score, the number of surviving humans in each house, the current house being invaded, hours completed and current points.

SCORING

Picking up new pod	**10 points**
Picking up partly formed pod	**20 points**
Picking up quivering pod	**30 points**
Disposing of a pod	**10 points**
Wakening sleeping person	**10 points**
Bonus per person still alive (calculated each hour)	**100 points**

Press the joystick button twice to commence a new game. To abort press START, SELECT or OPTION.

TYPING IT IN

Cassette and disk users should type in Listing 1, SAVE or CSAVE a copy, then RUN the program. The program will check each line of data and inform you of any errors. Correct any errors and RUN the program again until all errors are eliminated. When this is done answer the cassette/disk questions accordingly to create a boot tape or binary disk file.

Cassette users should load the boot tape created by firstly removing all cartridges and then turning on the computer while holding down the START key (XL and XE owners should hold down OPTION as well). Press RETURN and the tape will load and run automatically.

Disk users should type in Listing 2 and save it on the same disk as the binary file created by Listing 1. RUN the Listing 2 program with the disk in the drive and the game will load and run automatically.

A special note for disk users - if any other programs have been used prior to Listing 2 being loaded it is recommended that the computer be turned off and on again before the program is run to ensure that the game isn't corrupted by any data left in memory.

THE PODZ

```
WO 1 REM ******************************
RS 2 REM *          THE PODZ          *
RT 3 REM *             by             *
AN 4 REM *        Bill Halsall        *
SR 5 REM * -------------------------- *
KC 6 REM * PAGE 6 MAGAZINE - ENGLAND  *
WU 7 REM ******************************
NN 8 REM
AU 10 REM BOOT TAPE/OBJ CODE FILE MAKER
          BASED ON PROGRAM FROM ANALOG
AZ 20 REM
BH 43 REM
SR 44 DIM DAT$(100),HEX(22):RESTORE 46:FO
   R X=0 TO 22:READ N:HEX(X)=N:NEXT X:PAS
   S=0:TOTAL=0:TRAP 62:? "CHECKING DATA"
PA 45 LINE=99:RESTORE 100
EL 46 DATA 0,1,2,3,4,5,6,7,8,9,0,0,0,0,0,
   0,0,10,11,12,13,14,15
BW 48 LINE=LINE+1:? LINE:READ DAT$:IF LEN
   (DAT$)<>90 THEN 76
BL 50 DATLIN=PEEK(183)+PEEK(184)*256:IF D
   ATLIN<>LINE THEN ? "MISSING";CHR$(253)
   :END
MA 52 FOR X=1 TO 89 STEP 2:D1=ASC(DAT$(X,
   X))-48:D2=ASC(DAT$(X+1,X+1))-48:BYTE=H
   EX(D1)*16+HEX(D2)
GR 54 IF PASS THEN PUT #1,BYTE:NEXT X:REA
   D CHKSUM:GOTO 48
BO 56 TOTAL=TOTAL+BYTE:IF TOTAL>999 THEN
   TOTAL=TOTAL-1000
TS 58 NEXT X:READ CHKSUM:IF TOTAL<>CHKSUM
    THEN 76
VQ 60 GOTO 48
TQ 62 IF PEEK(195)<>6 THEN ? "ERROR ";PEE
   K(195);CHR$(253):END
XI 64 IF PASS THEN RESTORE 90:FOR X=1 TO
   26:READ A:PUT #1,A:NEXT X:CLOSE #1:END
PF 66 ? "(D)ISC OR (T)APE":GOSUB 80:IF K=
   ASC("D") THEN 70
RD 68 ? "READY CASSETTE AND PRESS RETURN"
   :OPEN #1,8,128,"C:":GOTO 74
IF 70 ? "READY DISC AND PRESS RETURN":GOS
   UB 80:IF K<>155 THEN 70
QW 72 OPEN #1,8,0,"D:PODZ.OBJ"
HW 74 PASS=1:LINE=99:RESTORE 100:TRAP 62:
   GOTO 48
PT 76 ? "BAD DATA";CHR$(253):END
ZM 79 REM ***GET KEY ROUTINE***
GO 80 CLOSE #1:OPEN #1,4,0,"K:":GET #1,K:
   CLOSE #1:RETURN
IY 90 DATA 0,133,192,96,230,189,230,196,7
   6,209,42,173,10,210,41,7,24,101,195,17
   0,96,0,0,0,0,0
FW 100 DATA 001600202820A9008D2F02A93C8D0
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   AA920850B18604CC5290000,637
UW 101 DATA 0000000000000000000000000BFBFB
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   7008000C000B8007600FFFF,12
CE 102 DATA FFFFFFFFFFFF00000000FFFFFFFF7
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   C5A0018247EE7FFC3A5FFFF,778
ZT 103 DATA 7E071C3E7F7F7F3E1C071C3E3E3E3
   E1C1C0F0E0E1F1F1F0E0E021C183E3E1D1C1CF
   3E7CFDBF3E7CFDB1C2A143F,191
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   C3F3C5C10101C3E1C7E1D1C0404383418383C1
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EH 105 DATA 2C181C3C1818381C2C987E1D7E410
   0F800F802FB03FB03FBFFFF527047003E07070
   707070707070707070741FC,738
UB 106 DATA 207070424C21707070705700365700
   03757003857003957003A57003B57003B70707
   0707070410F217070424C21,808
EH 107 DATA 4700300707070707070707070707074
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YG 108 DATA 321D100033231D1010101010A9C5A
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   0309D8C309DDC309D00389D,905
GW 109 DATA 00399D003AA9039D00369D0037E8E
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YC 110 DATA 9D0030C8C00BD0F2A9008D58308D5
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   9028D02368D0137A9048D10,159
JH 111 DATA 368D1137A9458D0C3AA200BD5D229
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   0319D00329D00339D00349D,517
PM 112 DATA 0035E8D0EBA93685CCA90085CBA00
   0B1CBA02091CBA04091CBA06091CBA08091CBA
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QG 113 DATA E6CCA5CCC93CD0D4601D31457E85A
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   A0000C4040AE4C400A2008A,458
LT 114 DATA 9D003E9D803E9D003F9D803FE810F
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   8FD00E09D003CA9FF38FD00,589
TC 115 DATA E19D003DE8D0EBBD30209D003CE81
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   D0FD2A9FC8D3002A9208D31,730
NU 116 DATA 02A200BD6A229DC002E8E009D0F5A
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   0732260207322A200BD8C29,542
IX 117 DATA 9D7E3EE8E008D0F56000000000000
   0AD8402D0FBAD8402F0FB60A93085CCA90085C
   BA891CBC8D0FBE6CCA6CCE0,822
LD 118 DATA 3CD0F360A5B1F0533028A5B038E90
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   F21EE2221EE2521EE2821EE,60
GF 119 DATA 2B214C8123A5B018690429048D04D
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   E2521CE2821CE2B21A90085,204
WE 120 DATA B1A5B2F0081869BFC6B28D01D2A5B
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GA 121 DATA 1869608D07D2D018A5B40A0A85B5A
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   5B80A0A0A69B085CBA92085,757
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   8D0F7A5B8490185B860A902,512
MK 127 DATA 85B7A5B938E90485B920832460A90
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IR 128 DATA FAA90185B6A9038D0BD0AD0AD2290
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SR 129 DATA 4AAA86BBBD24258DC502600ADA4A7
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   869308D3D2185BCA9368D30,61
AY 130 DATA 02A9218D3102A9C48DC4028DC302A
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   EE810FA60A900AA9D803FE8,381
DI 131 DATA 10FA60AD78022901D003209F25AD7
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   D78022908D00320CB2560A9,211
YD 132 DATA 0285B7A5B938E9044CB425A90085B
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   5B7A5BA38E9044CD425A904,130
RU 133 DATA 85B7A5BA1869048D002FA5B98D042
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   D062F1869048D052F8D052F,520
XX 134 DATA 8D072FA200BD042F38E9104A4A4A1
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   A1865BD85CB9D0C2FA5BC85,789
OD 135 DATA CCA000B1CBC981F0359D082FE8E00
   4D0C7AD002F85BA8D00D0AD042F85B9208324A
   203BD082FC94AF02FC94FF0,355
OF 136 DATA 1AC9CBF02DC9CCF051C9CDF053CA1
   0E660A9648D00D2A90A85B260A5BEF00C206C2
   585BEA93C85B44C9A2860A9,459
DJ 137 DATA 4985BDD00CA5BED033A90185BEA90
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   C8D00D2A90A85B34C9A2860,245
AB 138 DATA 2086264C9A2820862620 9A284C9A2
   8A5BEF0EC206C25A5BA8D03D0A4B9A200BD583
   C99803FC8E8E008D0F460A0,694
KP 139 DATA 00A93085BDA200BD1B2799102FA5B
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   DC030D0DFA91485BDA00020,221
CV 140 DATA 2327AA202E27C949F0F5A94991CBC
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continued overleaf

THE PODZ continued

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GU 141 DATA 2F85CCB1CB60A5C2F022AD0AD2186
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   D402F85CCB1CBF015C9CBF0,650
CK 143 DATA 11C9CCF005C9CDF03760B1CB18690
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   22907A8B9102F186902A8B1,42
JU 144 DATA CBC9CBF005C6BDD0E960A9CC91CB9
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   B60A5142904D0F9A200BDA0,277
AD 145 DATA 2FF04A85CB85BDA000BD402F85CCA
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   8E6CB4C2128A5CB18691485,484
OS 146 DATA CB4C2128A5CB38E91485CBB1CBD01
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   ACAD0FC99683CC8C008D0ED,912
VS 148 DATA 60206225206C258D03D0A90F8D300
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XM 149 DATA FE6F21BD6F21C91AD009A9109D6F2
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GO 150 DATA AD0CD02908F018A94C85B9A9648D0
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QR 151 DATA C4F01885BDA00A209A2888D0FAC68
   DD0F4A5132903D00485C2E61360A20038BD6F2
   1FD4F21F0049014B005E8E0,450
TQ 152 DATA 05D0EEA200BD6F219D4F21E8E005D
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   5C285BE85B08D1ED08D04D4,474
NF 153 DATA A90185C08513201329A200A9109D6
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GR 154 DATA 39E88E6C39E88E8C39E88EAC39607
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   3A82062272038272 0DF2720,307
OL 155 DATA B72A20ED28A5C2D00320832AA9008
   54DAC1FD0C007F00285C0602086222017232 0F
   52220742120DA26200C2320,449
VW 156 DATA 352920712820F223A9018D1C0220D
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   D8514A5C0F058A5B9C940F0,171
FZ 157 DATA 10AD1C0238E902B0E4AD1C02D0F34
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   620B128203C288D1ED020A1,242
OC 158 DATA 29A5C0F021A5B9C968D00BA5BEF09
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VW 159 DATA 8D01D2A9018D1C02AD1C02D0FBE8D
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   CC529AD0AD2290738E90290,99
LB 160 DATA F6AA18693085CCA00084C284CBB1C
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   A1869118D652185C260A900,665
YH 161 DATA 85C4A23086CCA91085BDA00084CBB
   1CBC949F01DC94AF019C8D0F3A5BD9D2921E8E
   036D0DFA5C438E903B004A9,186
```

```
FP 20 REM LOAD AND RUN ROUTINE FOR
        THE PODZ    .
OZ 24 OPEN #1,4,0,"D:PODZ.OBJ"
OL 25 POKE 850,7:POKE 852,0:POKE 853,32:P
   OKE 856,255:POKE 857,255
TB 28 X=USR(ADR("hhh▯LV▯"),16)
BO 30 CLOSE #1:X=USR(8232)
```

Listing 2

Be part of the action

at the ATARI COMPUTER SHOW

Alexandra Palace, Wood Green, London N22
Friday to Sunday, June 23 to 25, 1989
Fri & Sat: 10am – 6pm,
Sun: 10am – 4pm

The Atari Computer Show is back – with many new products and developments. Atari has grown to be one of the major players in the computer world, supported by an incredible wealth of top quality applications, games and utilities – all on view at this show.

MIDI

All the latest hardware and software in the rapidly expanding scene of micro music will be on display, including keyboards, samplers, sequencers and professional studio software.

With an Atari/Midi setup you can produce top-quality music, quickly and simply – editing out mistakes in a way that's impossible with live recordings. So if you're in any way interested in making music with your micro this is the place to come to find out all about it.

CAD

Computer Aided Design has grown to become one of the most important uses for modern computers. With a CAD system you can design houses, cars and electronic circuits – in a fraction of the time it would take you with pen and paper.

With the high speed and powerful graphics of Atari micros it's hardly surprising that bigger and better CAD programs are pushing back the frontiers all the time.

And only at the Atari Computer Show can you see all the latest systems under one roof.

BUSINESS

Many companies will be demonstrating their latest software and hardware, specially designed to release the full business potential of Atari computers.

As well as products for the 8-bit and ST, you'll be able to try out applications for the powerful Atari PC compatible series.

And you'll also be able to get expert advice from professionals.

DTP

The art of combining text and pictures is big business nowadays because, with a low-cost DTP program, you can create anything from a club newsletter to a monthly magazine or book.

At the show you'll be able to try out the latest scanners, digitisers and super-fast programs, and get a first-hand glimpse at the way DTP is set to develop in the future.



GAMES

Atari computers are renowned for their ability to run fast-action arcade-quality games.

The range of new software on show will demonstrate how the power of these machines is continually being stretched, producing faster and even more addictive games with superb graphics.

The winning entry in the STOS Gameswriter of the Year Award will be revealed, and several new exciting STOS accessories will be shown for the first time.

If you're a keen game player, you'll find there's so much on offer at the show – you're guaranteed a real treat!

DON'T MISS IT

So for a great day out – whether you want to see what the future holds for Atari computer users, take advantage of the bargains on offer or get advice on specific applications – the Atari Computer Show is the place to go.

And if you send in the coupon now, you'll save £1 off the price of a single ticket!

SPECIAL OFFER

For the first time we are now offering a family ticket for just £11, allowing entry for two adults and two children. So you can save up to £6 off the usual entry price!

How To Get There

Alexandra Palace is so easy to get to by car, rail, underground or bus. It has its own British Rail station, just nine minutes away from King's Cross, and there's a free bus service shuttling between station and show every 10 minutes.

If you're travelling by road, the show is only 15 minutes away from Junction 25 on the M25. Car parking is free.

DATABASE EXHIBITIONS

ADVANCE TICKET ORDER

POST TO: ***Atari Computer Show Tickets, Database Exhibitions, FREEPOST, Ellesmere Port, South Wirral L65 3EB.***

Please supply:

- ☐ Adult tickets at £4 (save £1) .... £______
- ☐ Under 16s tickets at £2.50 (save £1) .. £______
- ☐ Family ticket at £11 (save £6) .... £______

Total £______

☐ Cheque payable to Database Exhibitions
☐ Please debit my Access/Visa card no:

Expiry date: __/__

Signed..

Admission at door: £5 (adults), £3.50 (under 16s)

Advance ticket orders must be received by Wednesday, June 14

Name..
Address..
....
..............................Postcode..............

PHONE ORDERS: RING Show Hotline: 051-357 2961
PRESTEL ORDERS: KEY *89, THEN 614568383
MICROLINK/TELECOM GOLD ORDERS: 72:MAG001
Please quote credit card number and full address

A712

GAMES THEY NEVER RELEASED

Kirk Ruebottom searches through the American archives to discover some games you may never have heard of

Atari 8-bit owners, for the most part, do not have a wide selection of new software to choose from. The British market caters almost exclusively for the Commodore, ST, Spectrum and Amstrad machines and we tend to find ourselves neglected along with B.B.C. and MSX owners. Sometimes titles for the XL/XE are announced by software houses and never delivered. With the launch and re-launch of the 65XE and 130XE respectively, software availability could and should improve.

Five years ago things were different. Some Atari owners may remember when many new titles were being released for their 800's. Many of these games came from the likes of Datasoft, Synapse, Atari, Broderbund and Electronic Arts. Of course we paid through the nose for these American imports, but they were 'state of the art' in 1983 and many of them still stand up well today.

With good software now becoming hard to find readers may be interested to hear about games which were never officially released in the U.K. All of the titles below saw the light of day in America but due to such things as licensing problems, apathy on the part of distributors and the big re-shuffle at Atari in 1984, were never made available to British users except on limited import.

Some are classics, some are not. The majority of the games are from the 1983-4 period, but most have not dated in any way. A few are of more recent origin. Suggestions on how to obtain them are given at the end of this article.

First off the list is a game from Broderbund called **Karateka**. I remember shelling out twenty five pounds for an imported version of this a couple of years ago, thinking it was worth every penny. Supersmooth animation and great gameplay make it the best 'beat em up' ever on the Atari (and that includes Archer McClean's International Karate). **The Neverending Story** from Datasoft also contains some nice graphics. This adventure may have a weak parser and trite storyline, but the pictures make up for this. There is also some excellent music from maestro Gary ('Alternate Reality') Gilbertson.

It is surprising how many of the little-seen Atari games were actually released in Britain for the Commodore 64, usually on the U.S. Gold label. A case in point is **Pitstop 2**. The Atari version of this classic grand prix racing game is every bit as good as its Commodore counterpart, but Epyx and U.S. Gold did not see fit to release it over here.





Some of the early American adverts for software now long gone

A similar fate befell **Rainbow Walker** and **Scrolls of Abadon** (Synapse and Access Software titles respectively). The former, programmed by Atari veteran Steve Coleman is a wildly colourful variation on the 'Q-Bert' theme, but with more depth and features in its gameplay. The latter, a 'Pacman' variant in forced perspective 3-D featured four way scrolling and good graphics. **Stealth**, another one-time popular game on the '64 was also written for the Atari. Can anyone tell me why the Atari version of this classic 3-D 'shoot em up' was not released in Britain at the same time as the '64 version?

Software Automatic Mouth or **S.A.M.** (as far as I know an Atari-only product) is a speech synthesiser supplied on disk. This little corker, originally released back in '82 was way ahead of its time. You'd be hard pressed to find better speech quality on anything released since and that includes hardware add-on speech synths.

Activision, or Mediagenic as they are now known, also has a few Atari games which are U.S. only. One of these is **Master of the Lamps** in which you steer a man on a magic carpet through winding and dipping tunnels. Your view of the game is from behind the carpet, so there are some startling graphic effects in this one.

Universe by little-known software house Omnitrend cost around seventy or eighty pounds on import about four years ago! This multi-disk space extravaganza remains one of the most mysterious and elusive pieces of Atari software ever.

Mask of the Sun, a particularly atmospheric graphic adventure was once available in some shops on import. This Indiana Jones-type escapade, set in Mexico, has you searching pyramids, travelling in a jeep and negotiating some really ingenious traps and puzzles. With U.S. Gold recently acquiring Broderbund's back catalogue I had hoped that this classic game would make a re-appearance. What chance U.S. Gold?

Another game which I paid a fair amount of money for several years ago is **Ali Baba and the 40 Thieves** from Quality Software (who?). It's an old game, one of those requiring a Translator disk to work on XL/XE's, but it remains a terrific little role playing basher. Similar in format to the 'Apshai' trilogy and the 'Warriors of Ras' games, but with nicer graphics and music, this one is worth hunting down. If you have an Atari 800 and enough joysticks, four people can play it at the same time!

Alongside you'll find a rundown of some

A SELECTION OF AMERICAN GAMES THAT WERE ONLY AVAIILABLE ON IMPORT

Adventure Writer - a text adventure writing system. Atari 1984. Andromeda - a scrolling arcade game. *Gebelli Software 1982.*
Blue Print - a platform game, which was a hit in the arcades. CBS 1983.
C'est la Vie - an 'avoid the nasties' game, set in a maze, with your objective to make money. *Adventure International 1983.*
Chessmaster 2000 - a comprehensive chess program with many features, including a 3-D view of the board. *Electronic Arts 1986.*
Clipper - a strategy game of sailing round the horn. *Program Design Incorporated 1983.*
Countdown - a problem-solving arcade adventure, set in a nuclear missile base. *Synapse Software 1982*
Crystal Castles - a version of the popular arcade game. *Atari 1984.*
Dragon Riders of Pern - a strategy game, with arcade elements. *Epyx 1983.*
Earth Views - an educational piece of software, with thousands of maps of the earth at the press of a few keys. *Antic Catalog 1984.*
Final Flight - a flight simulator. *M.M.G. Software 1983.*
Gremlins - an arcade game of hack and thrust. *Atari 1984.*
Guardian of the Gorn - an arcade game with elements of 'Pacman' and 'Gridrunner'. *Inhome Software 1982.*
Halley Project - guide your spaceship on a journey round the solar system. *Mindscape 1985.*
Infiltrator - a flight simulator with arcade adventure sequences. *Mindscape 1987.*
Journey to the Planets - a puzzle-solving arcade adventure. *J.V. Software 1982.*
Jupiter Mission - a multi-stage space arcade adventure. *Avalon Hill 1983.*
Lords of Conquest - a 'Risk'-like game of land grabbing and conquest. *Electronic Arts 1986.*
M.Y. Chess 2 - another computer chess game with a 3-D option. *Datamost 1984.*
Miniature Golf - a 'crazy golf' game. *Xlent Software 1986.*
Pastfinder - a thinking man's 'shoot em up'. *Activision 1985.*
Pharaoh's Pyramid - a 'Q-Bert' inspired platform game. *Master Control Software 1983.*
Powerstar - probably the only graphic adventure available on cartridge. *Pandora Software 1986.*
Quest of the Space Beagle - the sequel to Jupiter Mission. *Avalon Hill 1984.*
Sands of Egypt - a 'lost in the desert' graphic adventure. *Datasoft 1982.*
Satan's Hollow - a spooky 'shoot em up'. *CBS 1982.*
Serpent's Star - the sequel to Mask of the Sun. *Broderbund 1984.*
Stone of Sisyphus - a fantasy role-playing graphic adventure. *Adventure International 1983.*
Ultima 1 - the first instalment of the award winning fantasy role playing series. *Origin 198?.*
Ultima 2 - bigger and better - you even get to travel in space. *Sierra On-Line 1983.*
Wavy Navy - a 'shoot em up featuring waves of planes and helicopters. *Sirius Software 1983.*
Whistler's Brother - a large disk-based platform game. *Broderbund 1984.*

other American titles which never made it to these shores, together with their original publishers and year of release.

This is by no means an exhaustive list. Look through back issues of American Atari magazines Antic and Analog and you are bound to see more.

There are a number of ways you might be able to acquire some of these rare titles. One route, and probably the best, is to enlist the help of a computer shop or mail order firm which has an American branch, or will import titles for you. The addresses of one firm which might (the keyword being 'might') be able to help in this respect is Ladbroke Computing International, 33 Ormskirk Road, Preston, Lancs, PR1 2QP. Computerhouse, who adverrtise regularly with Page 6 have also recently imported a number of American titles and you might just find one or two of these titles among them.

You could enquire directly to the software companies involved but bear in mind that some of them are no longer in business. Replying to classifieds might also yield results, as some people could have acquired these games a few years ago, when it was just possible to pick up imported Atari software. Another avenue would be to contact some User Groups in the U.S.A. or perhaps one of the people in past CONTACT columns who advertise for Pen Pals to see if they can find out whether these games are still available. If you do find sources for any of these games drop us a line so that we can tell other users about it.

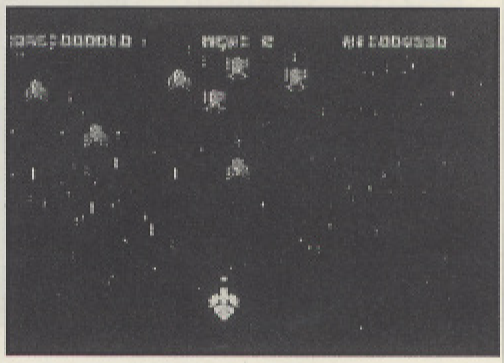
Finally, I hope that someone at U.S. Gold (so often the boon and the bane of Atari users) or another software house with Atari interests is reading this. Could YOU acquire the licenses to release these games in the U.K.?

DISK BONUS

GALACTIC CRESTA

by B. Wheaton

A 100% machine code all action blast



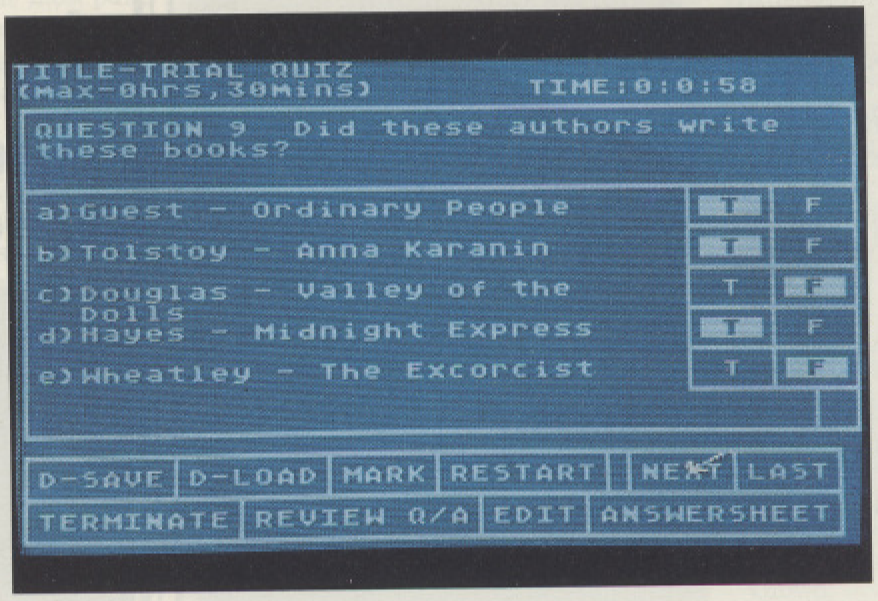
We are proud to present as the FREE BONUS on this issue's disk another 100% machine code program that was previously a commercial release! Galactic Cresta is a vertically scrolling shoot 'em up with hundreds of alien ships attacking you at a fast and furious pace. Similar to the arcade game Galaxians, these evil aliens swirl and dodge at ever increasing pace as you try to blast 'em.

It's fast, it's furious, it's fun. You'll have to be quick on the trigger to survive!

Galactic Cresta is the BONUS on the Issue 38 disk, which also contains all the other programs from this issue to save you hours of typing. The disk is just £2.95 and is available from PAGE 6, P.O. Box 54, Stafford, ST16 1DR. Just send a cheque or Postal Order with a written order or use the order form elsewhere in this issue.

MCQ-TEST

The Ultimate Examiner



David Rawlings presents a flexible examination or quiz program complete with question maker suitable for all Atari 8-bit machines with disk drive

Computers have been used on many occasions for teaching purposes. There are many examples of programs available for this purpose but very little on examinations. This program was designed to serve as either a simple 'test your kids quiz' or as a formal examination tool, and comes complete with a question editor. The program is also bulging with useful features and is easy to use.

The program allows the setting up of question files using a specially devised question editor. The format used is that of many British Universities and consists of a main statement referred to as a 'stem' and following this five statements called 'items' which refer to the stem, each of which may be either true or false. The examination is marked on a +1 for a correct answer and -1 for a wrong answer. No points are given for a question not attempted. Whilst it may appear cruel to subtract marks for a wrong answer, it would otherwise be possible for a less than educated monkey to get 50% on average!

FEATURES

The system is designed to operate in two modes. On running the program the operator is presented with the phrase "Full use of functions?". Selecting 'N' to this enters the 'formal' mode where the program works as a formal examination tool with the user only able to select questions, respond appropriately and view the 'answersheet' which is a record of all questions answered so far. In order to enter the 'formal' mode the operator types in a three letter password when requested. At the end of the examination or at any time before this it is possible to convert to the 'informal' mode with full functions available by pressing SELECT and re-entering the password. Once the exam has started all selections are made using the joystick which works similarly to a 'mouse' and moves an arrow on the screen. Moving this over the true or false selectors or the function boxes at the bottom of the screen and pressing the joystick button allows all choices to be made.

The choices available are

NEXT - The computer passes to the next question. Twenty questions per test are allowed and this option will cycle back to question 1 after question 20.

LAST - Selects the previous question.

ANSWERSHEET - Selecting this option will demonstrate all responses to all questions already attempted. It is easy to see how many have been attempted in an effort to achieve success in the exam. Simply repressing the joystick button returns the computer to the question previously attempted. Alternatively it is possible to move the joystick to any other question before pressing the button to return to any question of your choice.

The three options above are all that is required to perform an exam and is all that is permitted in the 'formal' mode. Several other features are available in 'informal' mode including:

MARK - The computer whizzes through all your answers and marks them appropriately. The final score is then displayed on the screen.
REVIEW Q/A - This option allows the user to review all the questions, see how they were attempted and diskern the correct answers which will slide in magically from the right side of the screen. Pressing the joystick button will advance through the review. Pressing SELECT at any time will exit this mode without going through all 20 questions.
D-SAVE - An interesting feature. In the middle of an 'informal' test it is possible to save all question responses so far onto disk for continuation later.
D-LOAD - This loads the file made above and continues the quiz at the question last selected. The time on the clock is also reset to its previous value. Obviously it is necessary to have the correct question file already in the computer.
RESTART - completely restarts the program. Do not select this option unless you are sure you want to.
TERMINATE - Ends the program and returns to BASIC.
EDIT - Allows the user to set up question files or edit any files on disk. Any file presently in memory will be lost and will require to be reloaded from disk if this file is to be edited.

TYPING IN THE PROGRAM

All three parts of the program should not be RUN until checked and saved to disk. Type in Listing 1 and SAVE as D:MCQTEST.1. For best effect set up an AUTORUN.SYS file from DOS 2.5 or elsewhere to autorun this program.
Type in listing 2. This is the main part of the program and must be saved as MCQTEST.2.
Type in Listing 3. This is the question editor which is called up when required. Save as MCQTEST.3.
Listing 4 is simply an example of 20 general knowledge questions. It can be seen that the standard of the test is up to the user and can be anything from simple word or English tests to University level exams. Use the question editor to enter this test or set up your own exams for your kids, your friends or your school pupils or students.

USING THE PROGRAM

As mentioned earlier it is beneficial to set up an AUTORUN.SYS Basic file to automatically run MCQTEST.1 on switching on. Alternatively type RUN "D1:MCQTEST.1" and the program will load. As already mentioned the first choice on running the program is to select full or limited function use depending on a 'formal' or 'informal' exam. Next you are prompted to enter the name of a question file previously created by the editor and resident on disk. This should be in the form of D1:FILENAME.EXT. The computer will respond to any file loading problem. The arrow appears in its little box in the corner, the file is loaded and pressing START will begin the exam and start the clock.
Choose your answers as 'true' or 'false' by placing the arrow on T or F and pressing the button. Moving the arrow to NEXT will allow you to proceed to the next question. The exam stops when the preset time limit expires or the operator chooses to stop.
On the prompt to enter a file on start up it is possible to type EDIT as an alternative and the question editor is loaded without commencing a test.

USING THE QUESTION EDITOR

The program is fairly self explanatory. Type N to create a new file, A to add or alter a previous file on disk. All options are

```
WO 1 REM ******************************
NO 2 REM *           MCQTEST          *
XL 3 REM *   A MULTIPLE CHOICE QUIZ   *
CD 4 REM *      by David Rawlings     *
FU 5 REM *         (Listing 1)        *
SS 6 REM * -------------------------- *
KD 7 REM * PAGE 6 MAGAZINE - ENGLAND  *
WV 8 REM ******************************
NO 9 REM
JE 10 REM LISTING 1 - SAVE AS MCQTEST.1
BC 12 REM
QH 20 GRAPHICS 18
VF 30 POSITION 5,2:? #6;"  PaGE 6  "
XO 40 POSITION 6,4:? #6;"PrESeNTs"
YU 50 POSITION 6,6:? #6;"mcq-test"
FD 60 IF PASS=1 THEN 140
XB 90 P708=PEEK(708):P709=PEEK(709):P710=
   PEEK(710):P711=PEEK(711)
QZ 100 FOR I=1 TO 40:FOR J=708 TO 711:POK
   E J,RND(0)*255:NEXT J:NEXT I
HF 110 POKE 708,P708:POKE 709,P709:POKE 7
   10,P710:POKE 711,P711
FN 120 PASS=PASS+1:IF PASS>1 THEN 200
YW 130 GRAPHICS 2:POKE 710,0:POKE 752,1:G
   OTO 30
IQ 140 ? "            by David Rawlings"
EE 150 ? "                  1989"
LG 200 RUN "D1:MCQTEST.2"
```

Listing 1 above
other listings overleaf

explained and whole questions or just parts of questions can be typed in. On the prompt to enter text use the keyboard with normal spacing. Try to keep the text as short as possible and the computer will fit the words into the grid. If it cannot you will be informed and you can reenter the text in a shortened form or with a hyphen inserted in a long word which the computer will try and split onto two lines. The five responses required to the five 'items' are entered as 'TFTFT' (or whatever) when prompted.
Once all editing has been completed select 'S' to save to disk. You are the prompted to enter the quiz name which will appear at the top of the screen when it is run. Following this enter the time limit and then the filename for storage on the disk, again in the form "D1:FILENAME.EXT".

SECURITY

Do not, repeat do not, press SYSTEM RESET. This will reboot the whole system. Use TERMINATE to get out of the program. In the 'formal' mode it is impossible to stop the program and peek inside for clues although again do not press SYSTEM RESET. The use of a password set by the examiner will prevent a keen student breaking into the 'informal mode'. Do not forget the password or it becomes impossible to mark the test.

So there we go. Full of interesting features, this program is still very easy to use as an examination tool and would be ideal for schools or colleges. The use of a joystick 'mouse simulator' should persuade the most keyboard fearing student to attempt a computer controlled test. Alternative tests can be set up for students to run informally and mark themselves in preparation for a real examination. The facilities are all here so start typing in your questions and setting up your examination files and put your family, friends or students to work!

MCQ TEST Listing 2

```
WO 1 REM ********************************
NO 2 REM *          MCQTEST             *
CW 3 REM * QUESTION SETTER AND EDITOR *
CD 4 REM *      by David Rawlings       *
HS 5 REM *         (Listing 3)          *
SS 6 REM * -------------------------- *
KD 7 REM * PAGE 6 MAGAZINE - ENGLAND  *
WV 8 REM ********************************
NO 9 REM
NE 10 REM LISTING 3 - SAVE AS MCQTEST.3
BC 12 REM
GD 100 GRAPHICS 0:GOSUB 1800:DIM QUESTDAT
   $(8905),N$(1),NAME$(20),MAN$(35),R$(1)
   ,PK(6),A$(114),B$(200)
HF 130 QUESTDAT$(1)=" ":QUESTDAT$(8905)="
    ":QUESTDAT$(2)=QUESTDAT$
OF 135 QUESTDAT$(8904,8905)="├♥"
GL 140 ? "ENTER: - N  NEW QUESTION SET":?
    "           A  ADD/ALTER OLD SET"
FE 150 INPUT N$
MK 160 IF N$<>"A" AND N$<>"N" THEN 140
MH 170 IF N$="A" THEN GOSUB 800
RE 190 REM
OD 200 REM QUESTION LOOP
DQ 210 GOSUB 1800:? " Enter question (1-2
   0) to write/edit":? "or enter 0 to con
   tinue"
PP 220 TRAP 2000:INPUT QUEST:QUEST=INT(QU
   EST):TRAP 40000
MK 230 IF QUEST<0 OR QUEST>20 THEN 210
PO 240 IF QUEST=0 THEN 600
GQ 250 GRAPHICS 0:GOSUB 1800:GOSUB 7000:G
   OSUB 7600
AC 270 GOSUB 1530:GOSUB 1000
HN 500 GO TO 200
SQ 600 REM NAME FILE
EZ 610 GRAPHICS 0:GOSUB 1800
EP 614 ? "Enter S - Save file to disc":?
   "        C - continue editing":? "
   P - Output file to printer"
WB 615 ? "        R - Return to main progra
   m"
BS 616 INPUT N$:IF N$<>"S" AND N$<>"R" AN
   D N$<>"C" AND N$<>"P" THEN 614
JI 617 IF N$="C" THEN 210
UY 618 IF N$="R" THEN 900
KP 619 IF N$="P" THEN 9000
VU 620 POSITION 3,6:? "Present title head
   er-"
YV 630 POSITION 4,8:? QUESTDAT$(8884,8903
   );
TB 640 ? :? "Do you want to write/change
   header?":? " Enter Y or N"
XZ 650 INPUT N$:IF N$<>"Y" AND N$<>"N" TH
   EN 640
WS 660 IF N$="N" THEN 680
YO 670 ? "Enter name- (max 20 chars)":INP
   UT NAME$:FOR I=LEN(NAME$)+1 TO 20:NAME
   $(I,I)=" "
HN 675 QUESTDAT$(8884,8903)=NAME$
JN 680 ? :? "TIME SET-";ASC(QUESTDAT$(890
   4));"hrs,";ASC(QUESTDAT$(8905));"mins"
KY 690 ? :? "Do you want to set/alter TIM
   E LIMIT":? "Y or N":INPUT N$:IF N$="N"
    THEN 720
YH 700 ? "Enter time in hrs,mins eg 1,30"
   :INPUT V1,V2
DS 710 QUESTDAT$(8904,8904)=CHR$(V1):QUES
   TDAT$(8905,8905)=CHR$(V2)
QW 720 REM
SB 750 REM COMMIT TO STORAGE DEVICE
FK 760 ? "ENTER FILENAME FOR STORAGE":INP
   UT NAME$
OS 770 TRAP 2150:CLOSE #1:OPEN #1,8,0,NAM
   E$:PRINT #1,QUESTDAT$(11,8905):CLOSE #
   1:TRAP 40000
ZC 780 TRAP 2100:? :? :? "Return to main
   program (Y/N)";:INPUT N$:IF N$="Y" THE
   N RUN "D1:MCQTEST.2"
VJ 790 RUN
MF 800 ? :? "ENTER NAME OF FILE eg D1:FIL
   ENAME.EXT"
KY 810 INPUT NAME$
TC 820 MAN$="?+hh?E┘h?D┘?N?B┘??H┘?G?I┘LV
   ?"
RZ 830 TRAP 2050:CLOSE #1:OPEN #1,4,0,NAM
   E$:A=USR(ADR(MAN$),ADR(QUESTDAT$)):CLO
   SE #1:TRAP 40000
RB 840 REM
ZO 850 RETURN
UL 899 REM RETURN WITHOUT SAVING
OG 900 ? "Are you sure? .Any file being "
   :? "edited and not saved will be lost"
US 910 INPUT N$:IF N$<>"Y" THEN 210
NV 920 TRAP 2100:RUN "D1:MCQTEST.2"
IC 1000 REM ROUTINE FOR ANALYSING INPUT
NO 1020 ? "Enter: H header    P part que
   stion":? "       W whole    A answers E
   -escape":INPUT R$:V=PEEK(ADR(R$))
LN 1025 IF V=65 OR V=66 OR V=67 OR V=68 O
TF 2055 IF HP1<134 THEN GOSUB 11000:GOSUB
    4150:GOTO 2500:REM REVIEW Q/A
SA 2060 IF HP1<154 THEN GOSUB 11000:GOSUB
    4900:GOTO 2500:REM EDIT
SW 2070 IF HP1<201 THEN GOSUB 9200:GOTO 2
   500:REM GOSUB ANSWERSHEET
LL 2080 GOTO 2500:REM NO CHOICE
YK 2100 IF VP1<150 THEN 2500
SU 2105 IF HP1<78 THEN GOSUB 11000:GOSUB
   1000:GOTO 2500:REM DSAVE
SM 2110 IF HP1<106 THEN GOSUB 11000:GOSUB
    1100:GOTO 2500:REM DLOAD
XJ 2120 IF HP1<126 THEN GOSUB 11000:GOSUB
    4510:GOTO 2500:REM MARK
WM 2130 IF HP1<156 THEN GOSUB 11000:GOSUB
    9600:GOTO 2500:REM RESTART
JH 2140 IF HP1<182 THEN GOSUB 4700:GOTO 2
   500:REM NEXT
ZE 2150 GOSUB 4750:GOTO 2500:REM LAST
NK 2500 GOTO 2000
LZ 3699 REM T/F ROUTINE
YZ 3700 SUBQUES=INT((VP1-46)/15.6)
IL 3710 IF HP1<190 THEN VLU$="T"
LM 3720 IF HP1>=190 THEN VLU$="F"
TM 3730 IF VLU$="T" THEN IF (PEEK(SCREEN(
   0)+313+(SUBQUES*80)))=52 THEN POSITION
    32,7+(SUBQUES*2):? " T ";:GOTO 3800
RF 3740 IF VLU$="T" THEN IF (PEEK(SCREEN(
   0)+313+(SUBQUES*80)))=180 THEN POSITIO
   N 32,7+(SUBQUES*2):? " T ";:GOTO 3800
MW 3750 IF VLU$="F" THEN IF (PEEK(SCREEN(
   0)+317+(SUBQUES*80)))=38 THEN POSITION
    36,7+(SUBQUES*2):? " F ";:GOTO 3800
KJ 3760 IF VLU$="F" THEN IF (PEEK(SCREEN(
   0)+317+(SUBQUES*80)))=166 THEN POSITIO
   N 36,7+(SUBQUES*2):? " F ";:GOTO 3800
SN 3800 REM MARK UP ANSWERSHEET
YP 3805 PLACE=QUEST*5+SUBQUES
SL 3810 IF PEEK(SCREEN(0)+313+(SUBQUES*80
   ))=180 AND PEEK(SCREEN(0)+317+(SUBQUES
   *80))=38 THEN AN$(PLACE,PLACE)="T"
WC 3820 IF PEEK(SCREEN(0)+313+(SUBQUES*80
   ))=52 AND PEEK(SCREEN(0)+317+(SUBQUES*
   80))=166 THEN AN$(PLACE,PLACE)="F"
FR 3830 IF PEEK(SCREEN(0)+313+(SUBQUES*80
   ))=52 AND PEEK(SCREEN(0)+317+(SUBQUES*
   80))=38 THEN AN$(PLACE,PLACE)=" "
IW 3840 IF PEEK(SCREEN(0)+313+(SUBQUES*80
   ))=180 AND PEEK(SCREEN(0)+317+(SUBQUES
   *80))=166 THEN GOSUB 3920
NR 3849 REM UPDATE SCOREBOARD BEFORE RETU
   RN
YF 3850 FOR I=0 TO 4
ZP 3855 Y=165+((QUEST-1)/4)*8+(((QUEST-1)
   /4)-INT((QUEST-1)/4))*4*198+40*I
EK 3860 IF AN$(QUEST*5+I,QUEST*5+I)="T" T
   HEN POKE ADR(BOARD$)+Y,52
VL 3870 IF AN$(QUEST*5+I,QUEST*5+I)="F" T
   HEN POKE ADR(BOARD$)+Y,38
KF 3875 IF AN$(QUEST*5+I,QUEST*5+I)=" " T
   HEN POKE ADR(BOARD$)+Y,0
GZ 3885 NEXT I
AT 3900 RETURN
RC 3919 REM SUBROUTINE TO COMPLETE LINE 3
   840
MU 3920 POSITION 32,7+(SUBQUES*2):? " T |
    F ";:AN$(PLACE,PLACE)=" ":RETURN
JA 3921 REM
QE 3999 GOTO 2000
XP 4000 REM SET UP BOARD POINTERS AND INI
   TIALIZE
PV 4010 DIM BOARD$(960),TEMP$(80),VLU$(1)
   ,AN$(105),RAN$(105),TRUE$(16),FAL$(16)
   ,REV$(81),SCREEN(1):SCREEN=1
OW 4015 AN$(105,105)=" "
SC 4020 RESTORE 5000:FOR I=0 TO 11:READ T
   EMP$:BOARD$(I*80+1,(I+1)*80)=TEMP$:NEX
   T I
BC 4030 DLIST=PEEK(560)+256*PEEK(561)
XL 4040 SCREEN(0)=PEEK(88)+256*PEEK(89):S
   CR0LO=PEEK(88):SCR0HI=PEEK(89)
CW 4050 SCREEN(1)=ADR(BOARD$):SCR1HI=INT(
   SCREEN(1)/256):SCR1LO=((SCREEN(1)/256)
   -SCR1HI)*256
PT 4060 QUEST=1
XD 4100 POKE DLIST+4,SCR0LO:POKE DLIST+5,
   SCR0HI
AH 4110 RETURN
GO 4140 REM REVIEW Q/A
IQ 4150 REM
FM 4160 BASE=PL1+307:FOR II=1 TO 20:QUEST
   =II:GOSUB 7600
XU 4165 REM PUT CORRECT ANSWER ON PM-GRAP
   HICS
YI 4170 FOR J=0 TO 4
BH 4180 IF RAN$(II*5+J,II*5+J)="T" THEN R
   ESTORE 4270:FOR K=1 TO 16:READ X:POKE
   BASE+J*16+K,X:NEXT K
NC 4190 IF RAN$(II*5+J,II*5+J)="F" THEN R
   ESTORE 4280:FOR K=1 TO 16:READ X:POKE
   BASE+J*16+K,X:NEXT K
FH 4200 NEXT J
GN 4205 FOR I=7 TO 15 STEP 2:POSITION 32,
   I:? " ";:POSITION 34,I:? " | ";:POSITI
   ON 38,I:? " ";:NEXT I
NC 4207 FOR JJ=220 TO 186 STEP -1:POKE H2
   ,JJ:NEXT JJ
JL 4210 POSITION 22,0:? "PUSH BUTTON";:FO
   R W=1 TO 20:NEXT W:POSITION 22,0:? "PU
   SH BUTTON":FOR W=1 TO 20:NEXT W
CW 4215 IF PEEK(53279)=5 THEN II=20:QUEST
   =0:GOSUB 7600:GOTO 4230
FO 4220 IF STRIG(0)=1 THEN 4210
GV 4230 POSITION 22,0:? "              ";:FO
   R JJ=186 TO 220:POKE H2,JJ:NEXT JJ
HK 4235 NEXT II:POSITION 22,0:? "CHOOSE O
   PTION":FOR W=1 TO 200:NEXT W:POSITION
   22,0:? "                "
BW 4240 HP1=198:VP1=138:POKE H1,HP1:A=USR
   (1536,VP1)
AV 4250 RETURN
FJ 4270 DATA 0,0,0,0,0,0,0,224,224,64,64,
   64,64,64,0,0
IM 4280 DATA 0,0,0,0,0,0,0,7,7,4,7,7,4,4,
   0,0
KO 4299 REM
SE 4300 REM SET UP QUESTIONS
XK 4310 DIM QUESTDAT$(8905),ANSWER$(200),
   MAN$(35)
LF 4350 QUESTDAT$(1)=" ":QUESTDAT$(8905)=
   " ":QUESTDAT$(2)=QUESTDAT$:AN$(1)=" ":
   AN$(105)=" ":AN$(2)=AN$
OH 4360 MAN$="?+hh?E┘h?D┘?N?B┘??H┘?G?I┘L
   V?"
GP 4370 TRAP 12500:CLOSE #1:OPEN #1,4,0,N
   AME$:A=USR(ADR(MAN$),ADR(QUESTDAT$)):C
   LOSE #1:TRAP 40000
VK 4375 SECSET=ASC(QUESTDAT$(8904,8904))*
   3600+ASC(QUESTDAT$(8905,8905))*60
XF 4380 POSITION 6,0:? QUESTDAT$(8884,890
   3)
NR 4385 POSITION 0,1:? "(max-";ASC(QUESTD
   AT$(8904));"hrs,";ASC(QUESTDAT$(8905))
   ;"mins)"
WO 4390 POSITION 8,12:? "press-START";:FO
   R W=1 TO 10:NEXT W:POSITION 8,12:? "pr
   ess-START":FOR W=1 TO 10:NEXT W
ED 4400 IF PEEK(53279)<>6 THEN 4390
AK 4410 FOR I=1 TO 20:RAN$(I*5,I*5+4)=QUE
   STDAT$(I*423+417,I*423+421):NEXT I
VW 4420 QUEST=0:GOSUB 7600:QUEST=1:GOSUB
   7600:POKE 18,0:POKE 19,0:POKE 20,55
AM 4500 RETURN
IN 4501 REM
BZ 4510 REM MARK ROUTINE
EC 4520 POKE DLIST+4,SCR1LO:POKE DLIST+5,
   SCR1HI:COR=0:WRO=COR:ZER=COR
XT 4530 FOR I=0 TO 99:POKE ADR(BOARD$)+16
   7+40*(((I/20)-INT(I/20))*20)+8*INT(I/2
   0),PEEK(ADR(RAN$)+I+4)+96
VE 4535 IF AN$(I+5,I+5)=" " THEN ZER=ZER+
   1:GOTO 4560
JH 4540 IF AN$(I+5,I+5)=RAN$(I+5,I+5) THE
   N COR=COR+1:SOUND 1,10,10,8:FOR W=1 TO
    10:NEXT W:SOUND 1,0,0,0
LX 4550 IF AN$(I+5,I+5)<>RAN$(I+5,I+5) TH
   EN WRO=WRO+1:SOUND 1,250,10,8:FOR W=1
   TO 10:NEXT W:SOUND 1,0,0,0
JB 4560 REM
FX 4570 NEXT I
OM 4580 FOR W=1 TO 200:NEXT W:POKE DLIST+
   4,SCR0LO:POKE DLIST+5,SCR0HI
VT 4590 Q=QUEST:QUEST=0:GOSUB 7600:QUEST=
   1:POSITION 11,7:? "RESULTS"
JE 4600 POSITION 10,9:? "CORRECT ";COR:PO
   SITION 10,11:? "WRONG   ";WRO:POSITION
    10,13:? "BLANK   ";ZER
CF 4610 POSITION 10,15:? "FINAL SCORE ";C
   OR-WRO
LB 4620 POSITION 10,17:? "---------------
   "
IX 4640 REM
CH 4650 HP1=198:VP1=138:POKE H1,HP1:A=USR
   (1536,VP1)
OR 4660 POSITION 22,0:? "CHOOSE OPTION";:
   FOR W=1 TO 150:NEXT W:POSITION 22,0:?
   "               ";
JG 4670 REM
BM 4680 RETURN
TJ 4699 REM CHANGE QUESTION NEXT
LR 4700 QUEST=QUEST+1:IF QUEST=21 THEN QU
   EST=1
BV 4710 Q=QUEST:QUEST=0:GOSUB 7600:QUEST=
   Q:GOSUB 7600
AW 4720 RETURN
IW 4730 REM
HI 4749 REM CHANGE QUESTION LAST
DZ 4750 QUEST=QUEST-1:IF QUEST=0 THEN QUE
   ST=20
CK 4760 Q=QUEST:QUEST=0:GOSUB 7600:QUEST=
```

Listing 2

```
   Q:GOSUB 7600
BL 4770 RETURN
AS 4900 REM EDIT ROUTINE
MZ 4910 REM AUTHORISATION
UQ 4920 POKE H1,0:POKE H2,0
LB 4930 TRAP 13000:RUN "D1:MCQTEST.3"
VE 4940 TRAP 40000:RETURN
SY 5000 REM DATA FOR SCOREBOARD 1
UR 5010 DATA QRRRRRRRRRRRRRRRRRRRRRRRRRRRR
   RRRRRRRRRRRRE|♥1:/22"/12:¯♥♥♥-⊞14%34♥¯♥
   0!'%♥| ♥♥♥♥♥♥♥|
XR 5020 DATA |♥♥press♥or♥use♥arrow♥to♥new
   ♥question♥♥|ARRRRRRRWRRRRRRRWRRRRRRRRWR
   RRRRRRWRRRRRRRD
PN 5030 DATA |┼ra¯♥♥♥|┼▄a¯♥♥♥|┼┤ a¯♥♥♥|┌┼a
   ¯♥♥♥|┌ra¯♥♥||♥♥b¯♥♥♥|♥♥b¯♥♥♥|♥♥b¯♥♥♥|♥
   ♥b¯♥♥♥|♥♥b¯♥♥|
AR 5040 DATA |♥♥c¯♥♥♥|♥♥c¯♥♥♥|♥♥c¯♥♥♥|♥♥c
   ¯♥♥♥|♥♥c¯♥♥||♥♥d¯♥♥♥|♥♥d¯♥♥♥|♥♥d¯♥♥♥|♥
   ♥d¯♥♥♥|♥♥d¯♥♥|
QK 5050 DATA |♥♥e¯♥♥♥|♥♥e¯♥♥♥|♥♥e¯♥♥♥|♥♥e
   ¯♥♥♥|♥♥e¯♥♥||┼─a¯♥♥♥|┼┤ a¯♥♥♥|┌┼a¯♥♥♥|r
   ┼a¯♥♥♥|┌┴a¯♥♥|
HR 5060 DATA |♥♥b¯♥♥♥|♥♥b¯♥♥♥|♥♥b¯♥♥♥|♥♥b
   ¯♥♥♥|♥♥b¯♥♥||♥♥c¯♥♥♥|♥♥c¯♥♥♥|♥♥c¯♥♥♥|♥
   ♥c¯♥♥♥|♥♥c¯♥♥|
UG 5070 DATA |♥♥d¯♥♥♥|♥♥d¯♥♥♥|♥♥d¯♥♥♥|♥♥d
   ¯♥♥♥|♥♥d¯♥♥||♥♥e¯♥♥♥|♥♥e¯♥♥♥|♥♥e¯♥♥♥|♥
   ♥e¯♥♥♥|♥♥e¯♥♥|
RE 5080 DATA |┼┼a¯♥♥♥|┼ra¯♥♥♥|rra¯♥♥♥|▄▄a
   ¯♥♥♥|┤ a¯♥♥||♥♥b¯♥♥♥|♥♥b¯♥♥♥|♥♥b¯♥♥♥|♥
   ♥b¯♥♥♥|♥♥b¯♥♥|
BG 5090 DATA |♥♥c¯♥♥♥|♥♥c¯♥♥♥|♥♥c¯♥♥♥|♥♥c
   ¯♥♥♥|♥♥c¯♥♥||♥♥d¯♥♥♥|♥♥d¯♥♥♥|♥♥d¯♥♥♥|♥
   ♥d¯♥♥♥|♥♥d¯♥♥|
HR 5100 DATA |♥♥e¯♥♥♥|♥♥e¯♥♥♥|♥♥e¯♥♥♥|♥♥e
   ¯♥♥♥|♥♥e¯♥♥||┼a¯♥♥♥|┼┴a¯♥♥♥|r┼a¯♥♥♥|r
   | a¯♥♥♥|─┼a¯♥♥|
ME 5110 DATA |♥♥b¯♥♥♥|♥♥b¯♥♥♥|♥♥b¯♥♥♥|♥♥b
   ¯♥♥♥|♥♥b¯♥♥||♥♥c¯♥♥♥|♥♥c¯♥♥♥|♥♥c¯♥♥♥|♥
   ♥c¯♥♥♥|♥♥c¯♥♥|
TT 5120 DATA |♥♥d¯♥♥♥|♥♥d¯♥♥♥|♥♥d¯♥♥♥|♥♥d
   ¯♥♥♥|♥♥d¯♥♥||♥♥e¯♥♥♥|♥♥e¯♥♥♥|♥♥e¯♥♥♥|♥
   ♥e¯♥♥♥|♥♥e¯♥♥|
IG 5300 REM
ZY 6000 REM BASIC SCREEN DRAW
DO 6010 GRAPHICS 0:GOSUB 7800:POKE 82,0:G
   OSUB 7000
PN 6020 POSITION 0,0:? "TITLE-";:REM CHAN
   GE TO TITLES
AA 6030 POSITION 24,1:? "TIME:";
ZV 6035 POSITION 0,19:? "┌────────┬──────────┬──
   ─────┬───────┬┬───────┬───────┐ ";
DL 6040 POSITION 0,20:? "|D-SAVE|D-LOAD|M
   ARK|RESTART||NEXT|LAST|"
MJ 6050 POSITION 0,21:? "├─────────┼─────────┼──
   ───┼────┼────┼┼────┼──────┤ ";
TH 6060 POSITION 0,22:? "|TERMINATE|REVIE
   W O/A|EDIT|ANSWERSHEET|";
BI 6070 POSITION 0,23:? "└──────────────┴──
   ─────┴─────┴──────────────┘";
FP 6080 IF NO=0 THEN 6100
BB 6085 POSITION 0,20:? "|███████|████████|█
   ████|████████|";
OC 6090 POSITION 0,22:? "|█████████████|██████
   ██████|█████|";
XX 6095 REM NOTE LINES 6085 AND 6090 ARE
   THE SAME AS 6040 AND 6060 WITH █ (INVE
   RSE SPCAE) TO REPLACE WORDING
AG 6100 RETURN
RV 7000 REM DRAW FRAME
KA 7005 POKE 82,0:POSITION 0,2:POKE 752,1
MB 7010 ? "┌──────────────────────────────
   ───────────┐";
HO 7020 ? "|QUESTION
             |";
VE 7030 ? "|
             |";
VH 7040 ? "|
             |";
WH 7050 ? "├──────────────────────────────
   ───┬────┬───┤";
EU 7060 ? "|a)
     | T | F |";
EG 7070 ? "|
     ├───┼───┤";
FK 7080 ? "|b)
     | T | F |";
EM 7090 ? "|
     ├───┼───┤";
EY 7100 ? "|c)
     | T | F |";
DQ 7110 ? "|
     ├───┼───┤";
FO 7120 ? "|d)
     | T | F |";
DW 7130 ? "|
     ├───┼───┤";
GE 7140 ? "|e)
     | T | F |";
```

```
HW 7150 ? "|
     ├───┼─┬─┤";
CJ 7160 ? "|
          | |";
XW 7170 ? "└──────────────────────────────
   ──────┴──┘";
AJ 7200 RETURN
UG 7300 REM TERMINATE
WR 7310 GOSUB 11000:POKE 580,0:POKE H1,0:
   GRAPHICS 0:POKE 82,2
FF 7320 END
IR 7330 REM
WU 7599 REM QUESTION PLOTTER ROUTINE
KQ 7600 POKE 82,1:POKE 83,38:IF QUEST=0 T
   HEN POSITION 10,3:? "      ";:GOTO 7620
LC 7610 POSITION 10,3:? QUEST;"   ";
ZE 7620 POSITION 13,3:? QUESTDAT$(QUEST*4
   23+1,QUEST*423+102)
PD 7640 POKE 82,3:POKE 83,38:POSITION 3,7
   :? QUESTDAT$(QUEST*423+103,QUEST*423+3
   82);;
PK 7660 POKE 83,36:POSITION 3,17:? QUESTD
   AT$(QUEST*423+383,QUEST*423+416);:POKE
    83,39
CP 7665 REM NOW FILL IN BOXES
IF 7670 POKE 83,39:FOR I=0 TO 4:PLACE=QUE
   ST*5+I
WL 7675 IF QUEST=0 THEN POSITION 32,7+I*2
   :? " T | F ";:GOTO 7700
KT 7679 REM
VC 7680 IF AN$(PLACE,PLACE)="T" THEN POSI
   TION 32,7+I*2:? " T | F ";
OK 7685 IF AN$(PLACE,PLACE)="F" THEN POSI
   TION 32,7+I*2:? " T | F ";
JJ 7690 IF AN$(PLACE,PLACE)=" " THEN POSI
   TION 32,7+I*2:? " T | F ";
FJ 7700 NEXT I
VK 7799 REM DISABLE BREAK
IX 7800 POKE 16,64:POKE 53774,64:RETURN
DI 7999 RETURN
BN 8000 REM PMGRAPHICS SETUP  4
XK 8010 P=PEEK(106)-16:POKE 54279,P:A=P*2
   56
ZE 8020 POKE 559,62
LV 8035 H1=53248:H2=53249
KX 8036 POKE 704,12:POKE 705,26
DT 8040 RESTORE 8900:FOR I=1536 TO 1536+4
   0:READ X:POKE I,X:NEXT I
WT 8050 RESTORE 9000:FOR I=1616 TO 1616+4
   0:READ X:POKE I,X:NEXT I
GA 8055 POKE 53277,3
PK 8056 POKE 623,2
CP 8060 HP1=198:HP2=220:VP1=136:VP2=110
WE 8070 PL1=A+1056:HI=INT(PL1/256):LO=((P
   L1/256)-INT(PL1/256))*256:POKE 207,LO:
   POKE 208,HI   -
ES 8080 POKE 205,LO:POKE 206,HI+1
FT 8090 POKE H1,HP1:POKE H2,HP2
UO 8095 MOVE=USR(1536,VP1):MOVE=USR(1616,
   VP2)
AL 8110 RETURN
ML 8890 REM DATA FOR PM MOVEMENT
EL 8900 DATA 104,104,104,141,41,6,160,0,1
   52,145,207,136,208,251,162,0,172,41,6,
   189,31,6,145,207,200
EV 8910 DATA 232,224,9,208,245,96,1,2,4,8
   ,144,160,192,240,0,0
HT 8920 REM * 41 BYTES
MU 9000 DATA 104,104,104,141,121,6,160,0,
   152,145,205,136,208,251,162,0,172,121,
   6,189,111,6,145,205,200
XJ 9010 DATA 232,224,9,208,245,96,255,129
   ,129,129,129,129,129,255,0,0
HC 9020 REM * 41 BYTES
TQ 9199 REM ANSWERSHEET ROUTINE
UC 9200 POKE DLIST+4,SCR1LO:POKE DLIST+5,
   SCR1HI:TH=HP1:TV=VP1:ANSW=1
ER 9210 HP1=60+32*(INT((QUEST-1)/4)):VP1=
   29+40*(((QUEST-1)/4)-INT((QUEST-1)/4))
   *4:MOVE=USR(1536,VP1):POKE H1,HP1
UV 9300 V=V+0.1*(V<5):GOSUB 200+STICK(0)*
   2
VI 9480 QT=INT((VP1-29)/40)+1+INT((HP1-51
   )/32)*4
LM 9490 IF STRIG(0)=1 THEN 9300
MA 9500 ANSW=0:VP1=TV:HP1=TH:MOVE=USR(153
   6,VP1):POKE H1,HP1:POKE DLIST+4,SCR0LO
   :POKE DLIST+5,SCR0HI
QP 9505 IF QT<>QUEST THEN QUEST=0:GOSUB 7
   600:QUEST=QT:GOSUB 7600
AU 9510 RETURN
DW 9600 REM RESTART ROUTINE
YA 9610 POKE H1,0:POKE H2,0:GRAPHICS 0
MM 9620 RUN
RN 9630 REM NO RETURN NEEDED
JC 9640 REM
DH 10000 REM INTRODUCTION AND FILE LOAD
CG 10006 REM
TU 10010 DIM NAME$(20):GRAPHICS 0:GOSUB 7
   800:POKE 710,0:POKE 752,1:POSITION 14,
```

```
   5:? "WELCOME";
GR 10020 POSITION 5,10:? "TO COMPUTER AID
   ED ASSESSMENT":FOR W=1 TO 100:NEXT W
KP 10050 POSITION 0,18:? "Please enter na
   me of question file":? "e.g. D1:FILENA
   ME.EXT"
GU 10055 ? "(or type EDIT for question ed
   itor)"
KV 10060 INPUT NAME$
AL 10070 IF NAME$="EDIT" THEN RUN "D1:MCQ
   TEST.3"
DD 10200 RETURN
CW 10990 REM OPTION ACCESS
LK 11000 IF X$="N" THEN GOSUB 20000:POP :
   GOTO 2500
DD 11010 RETURN
PK 11990 REM SET PASSWORD FOR LIMITED FUN
   CTION ACCESS
UK 12000 DIM X$(1),XXX$(3),YYY$(3)
AL 12005 ? "ACCESS ALL FUNCTIONS? (Y/N) "
   :INPUT X$:IF X$<>"Y" AND X$<>"N" THEN
   12005
LK 12007 IF X$="Y" THEN 12040
AR 12010 OPEN #1,4,0,"K:":? :? "Set passw
   ord - 3 letters "
SI 12020 FOR I=1 TO 3:GET #1,X:XXX$(I,I)=
   CHR$(X):NEXT I:CLOSE #1
CV 12030 ? :? XXX$:NO=1
DR 12040 RETURN
CD 12190 REM UNDO PASSWORD
CP 12200 SOUND 1,200,10,8:FOR WW=1 TO 15:
   NEXT WW:SOUND 1,0,0,0
QH 12205 POSITION 25,0:? "PASSWORD?"
GF 12210 OPEN #2,4,0,"K:":FOR KK=1 TO 3:G
   ET #2,X:YYY$(KK,KK)=CHR$(X):NEXT KK:CL
   OSE #2
YG 12220 IF XXX$=YYY$ THEN X$="Y":NO=0:GO
   SUB 6035
HX 12230 POSITION 25,0:? "            ":RET
   URN
KS 12490 REM TRAP ROUTINE
XD 12500 QUEST=0:GOSUB 7600:POSITION 4,8:
   ? "DISC INPUT ERROR"
HG 12510 POSITION 4,9:? "CHECK - DRIVE OK
   ?"
WH 12520 POSITION 12,10:? "FILE ON DISC?"
ZA 12530 POSITION 12,11:? "CORRECT FILE?"
HH 12540 POSITION 12,14:? "PRESS START"
FL 12550 IF PEEK(53279)<>6 THEN 12550
VR 12560 POKE H1,0:GRAPHICS 0:GOSUB 7800:
   RUN
DI 12690 REM
VC 12700 Q=QUEST:QUEST=0:GOSUB 7600:POSIT
   ION 4,8:? "DISC INPUT ERROR"
EE 12710 POSITION 4,9:? "DISCSAVE FILE"
OG 12720 POSITION 12,10:? "NOT ON DISC"
QR 12730 POSITION 12,11:? "OR DISC FAULT"
MD 12740 FOR WW=1 TO 100:NEXT WW:QUEST=Q:
   GOTO 1165
AK 12800 Q=QUEST:QUEST=0:GOSUB 7600:POSIT
   ION 4,8:? "DISC OUTPUT ERROR"
EH 12810 POSITION 4,9:? "DISCSAVE FILE"
MO 12820 POSITION 12,10:? "PROTECTED DISC
   ?"
LW 12830 POSITION 12,11:? "DISC FULL?"
HC 12840 POSITION 12,12:? "OR DISC FAULT?
   "
ZW 12850 FOR WW=1 TO 100:NEXT WW:QUEST=Q:
   GOTO 1050
SR 13000 Q=QUEST:QUEST=0:GOSUB 7600
KQ 13010 POSITION 4,8:? "DISC INPUT ERROR
   "
SI 13020 POSITION 4,9:? "QUESTION EDITOR"
MR 13030 POSITION 12,10:? "NOT ON DISC"
QC 13040 POSITION 12,11:? "OR DISC FAULT"
HC 13050 FOR WW=1 TO 100:NEXT WW:QUEST=Q:
   GOSUB 7600
SL 13060 HP1=198:VP1=138:POKE H1,HP1:A=US
   R(1536,VP1):RETURN
TY 14000 REM ROUTINE FOR TIME UP
NM 14010 QUEST=0:GOSUB 7600:POSITION 10,1
   0:? "TIME UP"
CU 14020 FOR LP=1 TO 10:SOUND 1,100,10,8:
   FOR W=1 TO 30:NEXT W:SOUND 1,0,0,0:FOR
    W=1 TO 50:NEXT W:NEXT LP
UM 14030 POSITION 10,13:? "NOW CHOOSE OPT
   ION"
IJ 14040 HP1=198:VP1=138:POKE H1,HP1:A=US
   R(1536,VP1):POKE 18,0:POKE 19,0:POKE 2
   0,0
DZ 14050 RETURN
DR 20000 SOUND 1,220,10,8:POSITION 25,0:?
    "ACCESS DENIED":FOR W=1 TO 30:NEXT W:
   POSITION 25,0:? "               ";
UV 20010 SOUND 1,0,0,0
DG 20020 RETURN
```

MCQ TEST The Question Maker

```
WO 1 REM ********************************
NO 2 REM *          MCQTEST             *
XL 3 REM *   A MULTIPLE CHOICE QUIZ     *
CD 4 REM *     by David Rawlings        *
GT 5 REM *        (Listing 2)           *
SS 6 REM * ---------------------------- *
KD 7 REM * PAGE 6 MAGAZINE - ENGLAND    *
WV 8 REM ********************************
NO 9 REM
LE 10 REM LISTING 2 - SAVE AS MCQTEST.2
AZ 20 REM
CP 100 POKE 580,1:GOSUB 7000:GOTO 300
HO 200 REM JOYSTICK ROUTINE
HL 210 IF HP1<200 AND VP1>10 THEN VP1=VP1
   +V:MOVE=USR(1536,VP1):HP1=HP1+V:POKE H
   1,HP1
ZD 211 RETURN
KR 212 IF HP1<200 AND VP1>10 THEN VP1=VP1
   -V:MOVE=USR(1536,VP1):HP1=HP1+V:POKE H
   1,HP1
ZJ 213 RETURN
NA 214 IF HP1<200 THEN HP1=HP1+V:POKE H1,
   HP1
ZP 215 RETURN
OW 218 IF HP1>50 AND VP1<180 THEN VP1=VP1
   +V:MOVE=USR(1536,VP1):HP1=HP1-V:POKE H
   1,HP1
AB 219 RETURN
JR 220 IF HP1>50 AND VP1>10 THEN VP1=VP1-
   V:MOVE=USR(1536,VP1):HP1=HP1-V:POKE H1
   ,HP1
ZF 221 RETURN
DG 222 IF HP1>50 THEN HP1=HP1-V:POKE H1,H
   P1
ZL 223 RETURN
WS 226 IF VP1<180 THEN VP1=VP1+V:MOVE=USR
   (1536,VP1)
ZK 227 RETURN
OW 228 IF VP1>10 THEN VP1=VP1-V:MOVE=USR(
   1536,VP1)
AD 229 RETURN
AZ 230 SECS=INT((PEEK(20)+256*PEEK(19)+65
   536*PEEK(18))/50):POKE 77,0
MH 240 POSITION 29,1:HRS=INT(SECS/3600):M
   INS=INT(((SECS/3600)-HRS)*60):SEC=SECS
   -HRS*3600-MINS*60-1
OC 245 REM PRINT TIME
SL 250 ? HRS;":";MINS;":";SEC;"  ";
IM 255 V=1
BW 258 IF ANSW=0 THEN IF SECS>SECSET THEN
    GOSUB 14000
FL 259 IF PEEK(53279)=5 THEN IF X$="N" TH
   EN GOSUB 12200
ZK 260 RETURN
VZ 300 GOSUB 12000:GOSUB 10000:GOSUB 6000
   :GOSUB 8000:GOSUB 4000:GOSUB 4300:GOTO
    2000
ZE 1000 REM ROUTINE FOR DISCSAVE
FR 1010 CLOSE #1:TRAP 12800:OPEN #1,8,0,"
   D1:DSAVE"
CV 1020 PUT #1,PEEK(18):PUT #1,PEEK(19):P
   UT #1,PEEK(20):PUT #1,QUEST
KH 1030 FOR I=1 TO 960:XX=ASC(BOARD$(I,I)
   ):PUT #1,XX:NEXT I
SB 1040 FOR I=1 TO 105:XX=ASC(AN$(I,I)):P
   UT #1,XX:NEXT I
MY 1050 CLOSE #1
GE 1055 TRAP 40000:HP1=198:VP1=138:POKE H
   1,HP1:A=USR(1536,VP1)
AR 1060 RETURN
JB 1100 REM ROUTINE FOR DISCLOAD
GE 1110 TRAP 12700:CLOSE #1:OPEN #1,4,0,"
   D1:DSAVE"
ME 1120 GET #1,P18:GET #1,P19:GET #1,P20:
   GET #1,QUEST
PR 1130 FOR I=1 TO 960:GET #1,XX:BOARD$(I
   ,I)=CHR$(XX):NEXT I
KZ 1140 FOR I=1 TO 105:GET #1,XX:AN$(I,I)
   =CHR$(XX):NEXT I
NA 1150 CLOSE #1
JZ 1160 POKE 18,P18:POKE 19,P19:POKE 20,P
   20
GS 1165 TRAP 40000:Q=QUEST:QUEST=0:GOSUB
   7600:QUEST=Q:GOSUB 7600:HP1=198:VP1=13
   8:POKE H1,HP1:A=USR(1536,VP1)
AW 1170 RETURN
NL 1999 REM MAIN ROUTINE LOOP 2000 TO 250
   0
CQ 2000 V=V+0.1*(V<5):GOSUB 200+STICK(0)*
   2:REM GOTO 2000
AG 2010 IF STRIG(0)=1 THEN 2000
PM 2020 SOUND 1,100,10,8:FOR W=1 TO 10:NE
   XT W:SOUND 1,0,0,0
MH 2030 IF HP1>174 AND VP1>46 AND VP1<124
    THEN GOSUB 3700:GOTO 2500:REM T/F ROU
   TINE
CH 2040 IF VP1<165 THEN 2100:REM SELECT B
   OTTOM ROW
UU 2050 IF HP1<90 THEN GOSUB 7310:GOTO 25
   00:REM TERMINATE
```

```
   R V=69 OR V=81 OR V=87 OR V=88 OR V=83
    THEN 1035
GO 1030 ? "ERROR":GOTO 1020
RI 1035 FOR J=0 TO 6:PK(J)=0:NEXT J
FV 1040 IF R$="A" THEN PK(1)=1
HJ 1050 IF R$="B" THEN PK(2)=1
IX 1060 IF R$="C" THEN PK(3)=1
KL 1070 IF R$="D" THEN PK(4)=1
LZ 1080 IF R$="E" THEN PK(5)=1
MM 1090 IF R$="Q" THEN PK(0)=1
DS 1100 IF R$="W" THEN FOR II=0 TO 6:PK(I
   I)=1:NEXT II
VR 1110 IF R$="X" THEN PK(6)=1
KH 1115 IF R$="S" THEN 1520
GL 1120 FOR II=0 TO 6:IF PK(II)=0 THEN 15
   10
SJ 1140 IF II=0 THEN ST1=26:ST2=64:LN=102
HK 1150 IF II>0 AND II<5 THEN ST1=28:ST2=
   -1:LN=56
TR 1160 IF II=5 THEN ST1=28:ST2=56:LN=94
AX 1200 GRAPHICS 0
CV 1203 GOSUB 1800:? "Now enter text-RETU
   RN":? :? "QUESTION ";QUEST:? "PART ";:
   IF II=0 THEN PRINT "header":GOTO 1220
GG 1205 IF II=6 THEN GOTO 1600
YM 1210 GOSUB 1800:? CHR$(II+64)
CU 1220 INPUT A$
VI 1230 IF LEN(A$)>LN THEN ? " LINE TOO L
   ONG by ";LEN(A$)-LN;"characters-":? :?
    "Try shortening it":? :? :GOTO 1220
AB 1235 IF LEN(A$)<ST1 THEN GOSUB 1700:GO
   TO 1430
IS 1240 REM TRY AND FIT IN GAPS
IJ 1250 IF A$(ST1,ST1)=" " OR A$(ST1,ST1)
   ="-" THEN GOTO 1320
WA 1260 REM SEARCH DOWN FOR GAP
IG 1270 FOR Y=ST1 TO 1 STEP -1:IF A$(Y,Y)
   <>" " AND A$(Y,Y)<>"-" THEN NEXT Y:? :
   ? "NO GAPS-TRY AGAIN!":GOTO 1220
PZ 1280 B$(ST1+1)=A$(Y+1)
BO 1290 FOR Z=ST1-1 TO Y STEP -1:POKE ADR
   (A$)+Z,32:NEXT Z:A$(ST1+0)=B$(ST1):POK
   E ADR(A$)+ST1-1,32
CV 1300 IF LEN(A$)>LN THEN ? :? "Adjustin
   g to fit grid lengthens line":? "beyon
   d limit. Shorten or insert '-'"
VX 1310 IF LEN(A$)>LN THEN ? " at or arou
   nd the ";ST1;"th character":GOTO 1220
IZ 1315 REM
OZ 1320 REM NOW LOOK AT SECOND GAP
EM 1330 IF ST2=-1 OR LEN(A$)<ST2 THEN GOS
   UB 1700:GOTO 1430
OJ 1340 IF A$(ST2,ST2)=" " OR A$(ST2,ST2)
   ="-" THEN GOTO 1420
VZ 1350 REM SEARCH DOWN FOR GAP
RQ 1360 FOR Y=ST2 TO ST1 STEP -1:IF A$(Y,
   Y)<>" " AND A$(Y,Y)<>"-" THEN NEXT Y:?
    "NO GAPS IN 2ND PART-RETRY":GOTO 1220
BH 1370 B$=A$(Y+1)
BP 1380 FOR Z=ST2-1 TO Y STEP -1:POKE ADR
   (A$)+Z,32:NEXT Z:A$(ST2+1)=B$:GOSUB 17
   00
TK 1390 IF LEN(A$)>LN THEN ? " Adjusting
   to fit grid lengthens line":? "beyond
   limit. Shorten or insert '-'"
XU 1400 IF LEN(A$)>LN THEN ? " at or arou
   nd the ";ST2;"th character":GOTO 1220
IK 1420 REM
FG 1430 REM NOW INSERT INTO QUESTDAT$
PC 1435 A$(LN+1)=" "
RE 1450 IF II=0 THEN QUESTDAT$(QUEST*423+
   1,QUEST*423+102)=A$
GE 1460 IF II>0 AND II<5 THEN QUESTDAT$(Q
   UEST*423+103+(II-1)*56,QUEST*423+103+(
   II-1)*56+55)=A$
WO 1470 IF II=5 THEN QUESTDAT$(QUEST*423+
   327,QUEST*423+416)=A$
IG 1500 REM
MU 1510 NEXT II
PQ 1520 GOSUB 7000:GOSUB 7600
DR 1530 POSITION 2,20
IS 1540 REM
IV 1550 REM
BB 1560 RETURN
KY 1595 REM ROUTINE FOR ANSWERS
VW 1600 ? "INPUT ANSWERS IN FORM OF 'TFTF
   T'"
CZ 1610 INPUT A$
GF 1620 IF LEN(A$)<>5 THEN ? "ERROR":? :G
   OTO 1600
YO 1630 FOR JJ=0 TO 4:XX=PEEK(ADR(A$)+JJ)
   :IF XX<>70 AND XX<>84 THEN ? "ERROR-no
   t T or F":GOTO 1600
OC 1640 NEXT JJ
TX 1650 QUESTDAT$(QUEST*423+417,QUEST*423
   +421)=A$
JQ 1660 GOTO 1510:REM AVOID MOST OF LOOP
KD 1695 REM
OX 1700 IF LEN(A$)<>LN THEN FOR Z=LEN(A$)
    TO LN:POKE ADR(A$)+Z,32:NEXT Z:REM FI
```

```
   LLS IN BLANKS
AQ 1710 RETURN
VE 1799 REM DISABLE BREAK
IR 1800 POKE 16,64:POKE 53774,64:RETURN
VT 1999 REM TRAPS
PM 2000 ? :? "NUMERICAL VALUES ONLY!":GOT
   O 210
JU 2050 ? "FILE INPUT ERROR":? "IS FILE O
   N DISC":FOR WW=1 TO 100:NEXT WW:GOTO 8
   00
ME 2100 ? "FILE INPUT ERROR":? "CORRECT D
   ISC?":FOR WW=1 TO 100:NEXT WW:TRAP 400
   00:GOTO 700
OA 2150 ? "FILE OUTPUT ERROR":? "Disc ful
   l or protected?":? "Drive connected":?
    "Illegal filename"
CQ 2160 FOR WW=1 TO 100:NEXT WW:GOTO 760
RV 7000 REM DRAW FRAME
PF 7005 GRAPHICS 0:GOSUB 1800:POKE 82,0:P
   OSITION 0,2:POKE 752,1
MB 7010 ? "┌──────────────────────────────
   ────────┐";
HO 7020 ? "|QUESTION
           |";
VE 7030 ? "|
           |";
VH 7040 ? "|
           |";
WH 7050 ? "├──────────────────────────────
   ──┬───┬───┤";
EU 7060 ? "|a)
    | T | F |";
EG 7070 ? "|
    ├───┼───┤";
FK 7080 ? "|b)
    | T | F |";
EM 7090 ? "|
    ├───┼───┤";
EY 7100 ? "|c)
    | T | F |";
DQ 7110 ? "|
    ├───┼───┤";
FO 7120 ? "|d)
    | T | F |";
DW 7130 ? "|
    ├───┼───┤";
GE 7140 ? "|e)
    | T | F |";
MW 7150 ? "|
    └───┴───┤";
CJ 7160 ? "|
          | |";
XW 7170 ? "└──────────────────────────────
   ──────┴───┘";
AJ 7200 RETURN
WU 7599 REM QUESTION PLOTTER ROUTINE
KQ 7600 POKE 82,1:POKE 83,38:IF QUEST=0 T
   HEN POSITION 10,3:? "     ";:GOTO 7620
LC 7610 POSITION 10,3:? QUEST;"   ";
ZE 7620 POSITION 13,3:? QUESTDAT$(QUEST*4
   23+1,QUEST*423+102)
PD 7640 POKE 82,3:POKE 83,30:POSITION 3,7
   :? QUESTDAT$(QUEST*423+103,QUEST*423+3
   82);;
PK 7660 POKE 83,36:POSITION 3,17:? QUESTD
   AT$(QUEST*423+383,QUEST*423+416);:POKE
    83,39
TG 7680 POSITION 2,1:? "            ANSWERS
   -      -";:POSITION 20,1:? QUESTDAT$(QU
   EST*423+417,QUEST*423+421);
DI 7999 RETURN
IJ 8020 REM
HE 8999 REM PRINTER OUTPUT
RP 9000 TRAP 40000:REM TRAP 9200
KL 9010 LPRINT QUESTDAT$(8884,8903):LPRIN
   T :LPRINT "TIME-";ASC(QUESTDAT$(8904))
   ;"hrs, ";ASC(QUESTDAT$(8905));"mins"
EC 9020 FOR II=1 TO 20:LPRINT
RK 9030 LPRINT "QUESTION - ";II
AM 9040 LPRINT QUESTDAT$(II*423+1,II*423+
   26)
PA 9045 LPRINT QUESTDAT$(II*423+27,II*423
   +64)
GM 9047 LPRINT QUESTDAT$(II*423+65,II*423
   +101)
SL 9050 FOR JJ=0 TO 4
KX 9055 LPRINT CHR$(65+JJ);") ";QUESTDAT$
   (II*423+103+56*JJ,II*423+103+56*JJ+27)
IH 9060 LPRINT QUESTDAT$(II*423+131+56*JJ
   ,II*423+158+56*JJ);"  -  ";QUESTDAT$(I
   I*423+417+JJ,II*423+417+JJ)
OH 9070 NEXT JJ
CV 9080 LPRINT QUESTDAT$(II*423+383,II*42
   3+416)
NV 9100 LPRINT :NEXT II:GOTO 9300
WH 9199 REM PRINTER ERROR
UL 9200 ? CHR$(125):? :? " PRINTER ERROR"
   :FOR WW=1 TO 100:NEXT WW
QN 9300 TRAP 40000:GOTO 610
```

Listing 3

Listing 4 - Sample questions

Sample MCQ-TEST question set. For best results make up your own!

1. The following cities are European Capitals
a) London
b) Paris
c) Frankfurt
d) Brussels
e) Vienna

TTFTT

2. The following can be found on the Muppet Show
a) Kermit
b) Daffy Duck
c) Scooter
d) Animal
e) Foghorn Leghorn

TFTTF

3. Recognised computer languages
a) BUGOV
b) C
c) Fortran
d) Pascal
e) Double Dutch

FTTTF

4. The following are square numbers
a) 15
b) 25
c) 98
d) 122
e) 81

FTFFT

5. The actors have played James Bond
a) Sean Connery
b) David Niven
c) Warren Mitchell
d) John Forsyth
e) Timothy Dalton

TTFFT

6. These authors wrote these books
a) Steinbeck - The Grapes of Wrath
b) Stevenson - Treasure Island
c) Shakespeare - Little Women
d) Fleming - The Devil Rides Out
e) Krantz - Mistrals Daughter

TTFFT

7. These are famous astronomers
a) Russell Grant
b) Patrick Moore
c) Galileo
d) Prof Pat. Pending
e) Beethoven

FTTFF

8. These songs are sung by
a) Tie a Yellow Ribbon - Tony Orlando
b) Let It Be - Beatles
c) See My Baby Jive - Roxy Music
d) Yellow Submarine - Monkees
e) Stairway To Heaven - Slade

TTFFF

9. Did these authors write these books?
a) Guest - Ordinary People
b) Tolstoy - Anna Karenanin
c) Douglas - Valley of the Dolls
d) Hayes - Midnight Express
e) Wheatley - The Excorcist

TTFTF

10. The following are elements in chemistry
a) Water
b) Brass
c) Copper
d) Iron
e) Plutonium

FFTTT

11. These are found inside a living cell
a) Nucleus
b) Lysosome
c) Mitochondrion
d) Zylon
e) Cytoplasm

TTTFT

12. These are continents
a) Africa
b) Iberia
c) Asia
d) Australia
e) Arabia

TFTTF

13. These are bones in the human body
a) Cerebellum
b) Femur
c) Gastric
d) Halarious
e) Occiput

FTFFT

14. These are all Scottish towns
a) Barrow in Furness
b) North Berwick
c) Fort William
d) Portree
e) Paisley

FTTTT

15. In chemistry these are gasses at room temperature
a) Helium
b) Aluminium
c) Hydrogen
d) Flourine
e) Sodium Bicarbonate

TFTTF

16. These characters have played Dr. Who
a) William Hartnell
b) Peter Cushing
c) John Noakes
d) David Niven
e) Patrick Troughton

TTFFT

17. These footballers played in the 1966 England World Cup team
a) Donald Ford
b) Gordon Banks
c) Alan Mullery
d) Jim Clarke
e) Bobby Moore

FTFFT

18. These numbers are prime numbers
a) 17
b) 25
c) 13
d) 100
e) 15242

TFTFF

19. The following are makes of computer
a) Apricot
b) Pear
c) Apple
d) Grapefruit
e) Lemon

TFTFF

20. The following statements refer to Atari computers
a) They never break down
b) The first 400/800 series appeared in 1979
c) The first micro to have sprite (PM Graphics)
d) The CPU is a Z80 chip
e) Atari Basic is now devoid of bugs!

FTTFF

Enter these questions and answers using the Listing 3 - the Question Maker

FLESH ON THE BONES

Ian Finlayson extends the Casette Database with several routines that begin to make a usable program, now you can start to enter data

In the last issue the framework of the address book database was drawn up - this time I will start to put some flesh on the bones. The individual parts of the program are not very complicated but I have certainly found the inter-relationships of the various modules of the program are more intricate than I expected, so I have drawn up another flow chart to show the way the 'Create Database' and 'Add Records' functions work. The listing in this issue will not run on its own, when you have typed it in (and checked it with Typo 3) LIST it to cassette (or disk), LOAD the first part of the program and then ENTER the new part so the two parts are merged. You will see a few lines in this listing which say 'REM **DELETE THIS LINE' - they have not been left in by mistake but are there to overwrite lines in the previous listing which must be removed as they will disrupt the new program flow. These lines can be deleted completely after the two programs have been merged.

The main functions in the program this time are:

* **Create Database**
* **Add Data to Database**
* **Save Database to Cassette**
* **Load Database from Cassette**

Three supporting sub-subroutines are also created:

* **Screen Draw**
* **Field Input**
* **Fill Fields**

INITIALISING STRINGS

The first requirement is to decide on the size of each Field which makes up a record. It is possible to set up a database to use variable length records but string manipulation is simpler with fixed records, although they are not as compact. Names and addresses are difficult to size because of the variety they contain, anything from 'Smith' to 'Fotheringay-Psmiff' and from '6 High Street' to 'Midsummer Cottage, Huntingdon Crescent'. Clearly the wasted space in the database will be considerable if each field is made big enough for every eventuality and this reduces the number of records that can be used, so I have compromised on the assumption that long entries can be abbreviated if they do not fit. The initialisation is dealt with in lines 12000-12100 and I have allocated sizes to fields as follows:

F1$	Forename	15
F2$	Surname	15
F3$	House and Street	27
F4$	Town	16
F5$	County	14
F6$	Postcode	8
F7$	Telephone	14
F8$	Date	6

The House/Street field is deliberately long to give room for houses with names rather than numbers. I did not want to use a separate field for the house name as extra programming would be needed to leave it out of printed records when not needed. The date field is included as a general purpose field which may make the database more useful. It could be used to record birth dates, dates of membership renewal etc.

Other strings are R$ (Record) which can hold Fields 1 to 8 (115 characters), DAT$ currently set to 11500 to hold 100 records and IN$ for use in input of data from cassette.

Initialise also sets the screen colours and ensures that the number of records (R) is initially zero.

ADD RECORDS SUBROUTINE

This subroutine, in lines 6000-6100, is used to add records to the end of a database in memory. First the variable R is incremented by 1 to take us from the last record of the current data to the first empty record. Next we go to a subroutine to draw the screen for data entry or display of records (Lines 13100-13299). Screen layout is very much a matter of taste - I have provided a space for each field which is boxed in so that the length of the field is quite clear, and an additional box at top right in which the record number is displayed. There are blank lines available below the table to allow prompts to be given.

The next step is data entry achieved in the 'Field Input' subroutine (Lines 13300-13390). To keep things simple I have not put any error trapping routines on the individual field inputs. It is possible to do almost anything on this screen by using cursor keys and any other keys just like using the normal screen editor. Each time RETURN is pressed it is assumed that the end of a field has been reached and the cursor will jump to the start of the next field. The lack of error trapping means that the screen can be left in quite a mess (inadvertently or deliberately) as the last field is completed.

If the input is corrupted the user will not know what exactly has been input into the variables F1$ to F8$, so the next step is to redraw the screen and insert their values into the table by means of the 'Fill Fields' subroutine (Lines 13400-13480). The data can now be examined and if there are any errors they can be corrected by answering 'N' to the prompt to return to the 'Field Input' subroutine. This time the fields are already filled in so you can press RETURN on any field that is correct to skip to the next,

and overtype any field that is not right to correct it. After this the redraw and redisplay sequence is repeated so you have another chance to check the data and go back yet again to change it if required. Once the data is checked and correct the individual fields are joined up into a continuous string R$, the record, and this record is added to the end of the large string DAT$ which is the whole of the data. A prompt is now given to ask if another record is to be added, if so the subroutine is restarted and if not we return to the main program menu.

CREATE DATABASE SUBROUTINE

The relevant lines are lines 2000-2060. As and you can see from the flow chart, the 'Create Database' subroutine is much the same as the 'Add Records' subroutine, but with a bit extra on the front. As we are creating a new database the program first checks to see if there is already some data in memory. If R is not zero there is data in memory and the program offers the chance to save before it is lost. Once the save is complete or the decision not to save is made the string DAT$ is cleared out and R is reset to zero. From here the add records routine is used (we are effectively adding a record to an empty database).

SAVE DATA SUBROUTINE

Saving the database is quite straightforward in lines 7000-7070. First we clear the screen and prompt for a data cassette to be prepared, then we open an output channel to cassette. The first thing to be sent to cassette by ? (or PRINT) #1,R is the number of records in the database, this is calculated by dividing the total size of the data by the size of a record.

It is possible to send DAT$ to cassette in one big lump, but if we attempt to ENTER a string longer than 244 characters from tape an error results, so the program breaks DAT$ into substrings R$ (one record) each 115 characters long for both save and load operations. The substrings are printed (using ?) to the tape one after another by the FOR - NEXT loop. Finally, after all the data is sent, the I/O channel must be closed before RETURNing to the main menu. Remember at this point the data is still in memory so more records can be added before saving again or using the other functions.

LOAD DATA SUBROUTINE

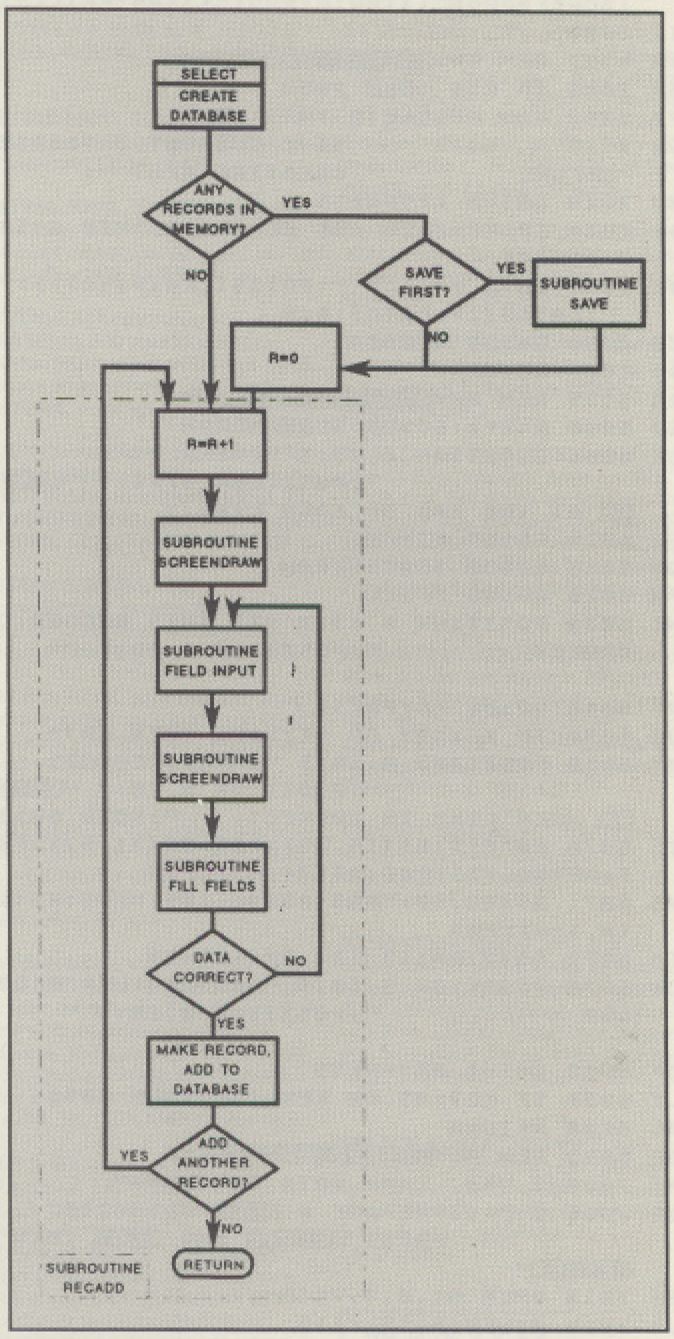
The load subroutine in lines 8000-8090 starts in a similar way to the create database subroutine as we again have to think about what is in memory before we import new data. As before the option of saving current data is given before DAT$ is cleared out.

The load (or INPUT) subroutine is the opposite of the save routine. A channel is opened for tape input and then R is recovered first. This allows the FOR - NEXT loop to be set up to recover the records one by one in the string IN$. For some reason strings that are INPUT from tape pick up 10 space at the front. These are stripped off to give R$ which is added to the total data string DAT$. Again the I/O channel must be closed before returning to the main menu.

SO WHAT HAVE WE GOT?

We now have the means of creating, saving, loading and adding to a database, other functions are still dummy. This means that there is as yet no way of reviewing the data. If you want to see your data in the form of a very large string this can be done by pressing the BREAK key to stop the program while you have data in memory, then clearing the screen and typing '? DAT$' on a clear line. When RETURN is pressed the data string will be printed to your screen.

If you have problems with what has been done so far write to me enclosing a stamped self addressed envelope and I will try to help. My address is: **Ian Finlayson, 60,Roundstone Crescent, East Preston, West Sussex, BN16 1DQ.**



PROGRAM LISTING OVERLEAF

Ian Finlayson's Casette Database Part 2

```
WO 1 REM ******************************
AA 2 REM *     TUTORIAL SUBROUTINE    *
BJ 3 REM *     ADDRESS BOOK PART 2    *
XT 4 REM *            by              *
CN 5 REM *       Ian Finlayson        *
OF 6 REM *----------------------------*
KD 7 REM * PAGE 6 MAGAZINE - ENGLAND  *
WV 8 REM ******************************
NO 9 REM
MK 20 SORT=3000:CREATE=2000:MAINMENU=1000
   :SCREENDRAW=13100:FINPUT=13300:FFILL=1
   3400
RW 1999 REM ***CREATE D'BASE***
BX 2000 IF R=0 THEN 2050
YX 2001 REM **DELETE THIS LINE
GA 2010 ? "K↓↓↓        SAVE CURRENT DATABASE
    BEFORE          CREATING NEW? ";
NJ 2020 GOSUB KEYPRESS
DY 2030 IF KEY<>78 AND KEY<>110 THEN GOSU
   B DBSAVE
VC 2040 DATA $(1)=" ":DATA$(LEN(DATA$))="
    ":DATA$(2)=DATA$:R=0
ZB 2050 GOSUB RECADD
AS 2060 RETURN
RA 5999 REM ***ADD NEW RECORD**
GV 6000 R=R+1:GOSUB SCREENDRAW
LK 6005 POSITION 8,19:? "ENTER DATA -
             ":POSITION 8,20:? "RETU
   RN AT THE END OF EACH LINE."
ES 6010 GOSUB FINPUT
JU 6015 GOSUB SCREENDRAW
PW 6020 GOSUB FFILL
WG 6030 POSITION 8,19:? "IS THIS RECORD C
   ORRECT?          ":POSITION 8,20:? "
                                       "
NT 6040 GOSUB KEYPRESS
UQ 6050 IF KEY=89 OR KEY=121 THEN 6070
HS 6060 POSITION 8,19:? "AMEND RECORDS -
                ":POSITION 8,20:? "RETU
   RN WHEN LINE IS CORRECT.   ":GOTO 6010
TZ 6070 R$=F1$:R$(16,30)=F2$:R$(31,57)=F3
   $:R$(58,73)=F4$:R$(74,87)=F5$
NS 6071 R$(88,95)=F6$:R$(96,109)=F7$:R$(1
   10,115)=F8$
EA 6072 DAT$(R*115-114,R*115)=R$
GX 6075 POSITION 8,19:? "ADD ANOTHER RECO
   RD?              ":POSITION 8,20:? "
                                       "
OF 6080 GOSUB KEYPRESS
LY 6090 IF KEY=89 OR KEY=121 THEN 6000
AG 6100 RETURN
OP 6999 REM ***   SAVE DATA   ***
MT 7000 ? "K▸     *** DATA SAVE ***"
ST 7005 ? "↓↓↓PREPARE A DATA CASSETTE...
              PRESS RECORD AND PLAY THEN
   RETURN"
BE 7010 OPEN #1,8,0,"C:"
JA 7020 R=LEN(DAT$)/115
YK 7025 ? #1,R
XJ 7030 FOR X=1 TO R
XI 7040 R$=DAT$(X*115-114,X*115)
OP 7050 ? #1,R$
CG 7060 NEXT X:CLOSE #1
BA 7070 RETURN
EU 7999 REM ***   LOAD DATA   ***
ZA 8000 ? "K▸*** LOAD DATA ***"
VB 8005 ? "↓↓↓DO YOU WISH TO SAVE THE CUR
   RENT DATA  BEFORE LOADING ANOTHER SET?
   "
NM 8010 GOSUB KEYPRESS
XP 8020 IF KEY=89 OR KEY=121 THEN GOSUB D
   BSAVE
IH 8025 DAT$(1)=" ":DAT$(LEN(DAT$))=" ":D
   AT$(2)=DAT$
KI 8030 ? "K↓↓↓LOAD CASSETTE WITH NEW DAT
   A -         PRESS PLAY  AND RETURN"
ZK 8040 OPEN #1,4,0,"C:"
OX 8050 INPUT #1,R
XT 8060 FOR X=1 TO R
QB 8070 INPUT #1,IN$:DAT$(X*115-114)=IN$(
   11)
CN 8080 NEXT X:CLOSE #1
BH 8090 RETURN
GV 11999 REM ** INITIALISE ***
MC 12000 DIM R$(115),F1$(15),F2$(15),F3$(
   27),F4$(16),F5$(14),F6$(8),F7$(14),F8$
   (6),DAT$(11500),IN$(125)
CW 12010 SETCOLOR 2,14,6:SETCOLOR 4,14,6:
   SETCOLOR 1,0,0
PB 12020 R=0
DE 12100 RETURN
PY 13099 REM ** SCREEN DRAW ***
KB 13100 ? "K";:? "┌──────────────────────
   ──────────────────┐"
DU 13110 ? "|          ┌forename──────────┐   ┌REC
   ORD NO┐|"
LD 13120 ? "| 1.       |                  |   |***
       ***||"
YB 13130 ? "|          ├surname───────────┤   └───
   ──────────┘|"
AN 13140 ? "| 2.       |                  |
          |"
GX 13160 ? "|          ├house & street──┬──────────
   ──────────┐|"
RX 13170 ? "| 3.       |
          | |"
HJ 13180 ? "|          ├town─────────────┬──────────
   ──────────┘|"
FT 13190 ? "| 4.       |                 |
          |"
KQ 13200 ? "|          ├county─────────┬─┘
          |"
YA 13210 ? "| 5.       |               |
          |"
ZY 13220 ? "|          ├postcode┬──────┤
          |"
DO 13230 ? "| 6.       |        |
          |"
UN 13250 ? "|          ├telephone──────┤
          |"
ZS 13260 ? "| 7.       |               |
          |"
DC 13270 ? "|          ├date (ddmmyy)──┘
          |"
YE 13280 ? "| 8.       |      |
          |"
JX 13290 ? "|          └──────┘
          |"
ZT 13295 ? "└──────────────────────────────
   ──────────┘"
FX 13296 RETURN
BT 13299 REM ** FIELD INPUT ***
KM 13300 POSITION 31,2:? R;"**"
QT 13305 POSITION 8,2:INPUT F1$
SJ 13310 POSITION 8,4:INPUT F2$
UY 13320 POSITION 8,6:INPUT F3$
XN 13330 POSITION 8,8:INPUT F4$
BX 13340 POSITION 8,10:INPUT F5$
EP 13350 POSITION 8,12:INPUT F6$
HH 13360 POSITION 8,14:INPUT F7$
JZ 13370 POSITION 8,16:INPUT F8$
OB 13380 R$=F1$:R$(16)=F2$:R$(31)=F3$:R$(
   55)=F4$:R$(71)=F5$:R$(85)=F6$:R$(93)=F
   7$:R$(107)=F8$
EW 13390 RETURN
IK 13399 REM ** FILL FIELDS ***
KP 13400 POSITION 31,2:? R;"**"
JP 13405 POSITION 9,2:? F1$
LB 13410 POSITION 9,4:? F2$
NM 13420 POSITION 9,6:? F3$
PX 13430 POSITION 9,8:? F4$
HE 13440 POSITION 9,10:? F5$
JS 13450 POSITION 9,12:? F6$
MG 13460 POSITION 9,14:? F7$
OU 13470 POSITION 9,16:? F8$
EV 13480 RETURN
```

CONTACT

FOR SALE

XL SYSTEM: 800XL with 1050 disk drive, 1010 tape recorder, over 80 games on tape, two large boxes of disks, touch Tablet with software, light pen and manual, 43 issues of Atari User, issues 10 to 21 of PAGE 6, joystick, paddles, manuals and a few books. All for £185. Tel. Medway (0634) 727453 and ask for Mark

XL SYSTEM: 800XL, 1050 disk drive, 1010 cassette recorder, 1020 printer, joystick, over £300 worth of software, plenty of blank disks, disk box, over 30 issues of Atari User. £300 o.n.o. Will deliver in area. Write to Mr M. Harris, 76, Great Gannet, Welwyn Garden City, Herts, HL7 3DE

800 (Not XL!) SYSTEM: With two 1050 disk drives, 15 blank disks plus box, tape recorder, plus 4 manuals. Also Basic Pascal Assembly and ES Forth Language. All as new. £215 or nearest offer. Phone Andrew on 01-464-4786

MODEM: 300 and 1200 Baud with Datari Interface plus software and intro to bulletin boards, ideal for any Atari computer. £100. Phone Howard 0423-879533 after 6pm or weekends

XL SYSTEM: Only £175 for 800XL, 1050 drive, XC12 cassette plus £200 of software, mainly strategy and wargames. Also 40 used discs and mags. Prefer buyer collects. Would split software. Phone Havant (0705)-484234

XL SYSTEM: 800XL, 1020, joystick, some software. £75. Telephone Michael on 094575-226 (Guyhirn, Cambs)

8-BIT CLEAROUT: XC12 cassette deck £10; Touch Tablet with Atari Artist software £25; Alphacom 80-column printer with interface and PSU £50; Various software on cassette and disk from £1.00. Everything is in as new condition. Call Jon on 0825-67473 after 6pm

1029 PRINTER: Including manual and various software (Word processor and Screendump). All leads, boxed, £100. Please write to Simon Bodger, 12 Haresfoot Close, Funtington, Chichester, W.Sussex. PO18 9LP

XL SYSTEM: Starter pack, including 800XL, 1010 data recorder, manuals, starter books on basic and machine code, plenty of tape software. Only £40. Also 1050 Disk Drive complete with 30 disks packed with software, 50-capacity lockable disk case, Transdisk IV, boxed wargames, Autoduel, Silent Service and Ogre. Perfect as disk upgrade for only £80. Everything fully boxed and in excellent condition. ST forces sale! Tel. Adam on (0253) 735061 between 6pm and 11pm

XL SYSTEM: 800XL, XF551 Disk drive, recorder, approx. 100 games on cassette, disk box, 3yrs. Atari User magazines, manuals. Excellent condition, £150 o.n.o. Tel: 0274-832997

XL SYSTEM: 800XL with 256K Ramdisk and 1050 drive (fitted with ISP plate - three drives!), mono monitor (9-inch), Centronics interface, Basic XL cartridge and manual, assembler and manual, Mini Office 2, loads more software. Mapping the Atari, Atari Basic (2 editions), Hardware Info., over 30 issues of Atari User, some Monitor and Page 6, plus cabinet to house above, £330 o.n.o. Tel: 0243-830564 evenings and weekends

XL SYSTEM: 800XL with tape recorder, touch tablet, PSU, ariel lead, many games and cartridge, £85 o.n.o. XL is boxed and in excellent condition or will swap for Spectrum+2. Must have joystick and games, still boxed/excellent condition. Contact Robert on 0978-358318

520STFM SYSTEM: Summer Pack, mouse, joystick, 5 games, 5 PD disks, Atari basic Atari ST Internals, ST Tricks & Tactics, joystick extenders. Only 3 months old, £400. Akhtar 40/80 track double sided drive, £50. Honeywell L11 daisywheel printer and ribbon, £50. Exchanges and offers considered. Contact Rickie Sharma, 95 Urney Road, Strabane, County Tyrone, Northern Ireland, BT82 9RT

850 INTERFACE: Complete with box, Sekoshia GP80 printer, Issues Vol 1/1 to Vol 4/7 of Atari User (no splits), Atari Technical Reference Manual, SSI Gettysburgh, Chickamauga, Shilo, FIG Forth plus mouse, open to offers on all articles. Call Ian on 0304-617798 after 5pm

DIGICOM MIDI INTERFACE: Including 16 track sequencer, Atari music composer cartridge, advanced music composer disk. Ring Steve (0602)-847330

XL SYSTEM: 800XL, 1050 disk drive, PM 4401A cassette unit, touch tablet, joystick, £200+ worth of software, manuals. reference book, some Atari User magazines. £250 o.n.o. Telephone 0602-201718 after 6pm

8-BIT SYSTEM: Atari 800, £40, Happy 1050, £120, Control Card and S/W for 800XL, £35, big box of S/W, £50. Phone 0600-6144

XL SYSTEM: 800XL, 1050 disk drive, 1010 cassette, joystick, manuals, £100+ worth of software, inc. Mercenary/Leaderboard, £160 o.n.o. Tel. Dave on 0494-448055 after 7pm

XL SYSTEM: 800XL, 1050, joystick, software (not much), manuals, £200. Buyer must collect. Will not split. Tel. Cardiff (0222)-628125 ask for Richard

PRINTERS: Perfect 1029 with Font-IV, 10-Print, ribbons, dumps etc., plus 822 thermal with paper (needs P.S.U.). Swap for 1050 with doubler or XF551 and DOS, or £120. Stag prof. PP40 half meg onboard RAM. 8 gang EPROM programmer, with s'ware updated to PP42/41M100, sensible offers please (might consider swap for extensive 1040STFM system). Also stacks of 8-bit software for sale. Phone 01-446-6296

XL SYSTEM: 800XL with 256K RAM memory expansion. Grafix printer interface, 1050 disk drive with doubler chip, XC12 data recorder, numerous disks, Atariwriter cartridge & manual, Atari 1027 printer (boxed with spare ink roller) - £225. Page 6, Analog, Antic magazines - several years full runs of each in binders - £35. Books:- Technical Reference Notes, De Re Atari, Atari Roots (machine code), Assembly Language Programming, Master Memory Map, Your Atari Computer, Speedscript, Compute's Mapping The Atari, Atari Collection 2, 3rd Book Of Atari, Atari Programming, 40 Great Flight Simulator Adventures & miscellaneous others all for £75. Tel. Sheffield (0742) 360962 after 7.15pm

XE SYSTEM: 130XE with manual, dust cover and 114 games, joystick, XC11 tape recorder and mags. Good condition, £110. Ring 699-4301 any time

XE SYSTEM: 1050 disk drive, XC11 cassette, 1020 colour printer/plotter, dust covers, touch tablet, joysticks, quality software including Replay sampler, Movie Maker, Colossus Chess 4, Super 3D Plotter II, Mercenary, Silent Service, Archon, etc. Over £150 worth of books, manuals and magazines. Everything in excellent condition. All worth over £700, but will accept £400 o.n.o. Tel. 01-435-3351

ST SYSTEM: 520STFM, SC1224 Colour Monitor, joystick, mouse, 22 games. Unwanted prize so BRAND NEW! Worth over £800, accept £650 o.n.o. Tel. 0223-871523

FLIGHT SIMULATOR II: For ST, £25, Euromax Elite Microswitch Joystick, £6. Xmas presents never used. Tel. Nigel on 01-223-6674

XL SYSTEM: 800XL, 1050 disk drive, plus games on disk for £200. Tel. 0702-205764 any time

XL SYSTEM: 800XL, 1050 drive, 1029 printer, 1010 cassette, all in excellent condition with manuals, software and dust covers, £300 o.n.o. Write to: D. Purvis, 6 Llanbleddian Gardens, Cathays, Cardiff, CF2 4AT

XL SYSTEM: 800XL, 1010 recorder, manuals and over 25 games, £65. Tel. Melton Mowbray (0664) 60630

XL SYSTEM: 800XL, XC12 data recorder, 2 joysticks, over £200 worth of software, loads of mags and books, all v.g.c., sell for £130 o.n.o. Tel. 0425-52988, ask for Mark

800 SYSTEM: 48K computer, 810 and 1050 disk drives, 850 interface module, 410 cassette, touch tablet with Atari Artist, plus various other software, £400. Tel. (0256)-473246, evenings please

MAGAZINES: Atari User, November 1985 to November 1988 and others, 47 magazines - £21. Books:- Homework Helper, £2; Guide To 600XL/800XL, £2.10. Hardware:- Atari Joystick, £2.25. Tel. (0444)-459551

ST SYSTEM: 520STFM, £200. Trinity, STOS, compilations, Borrowed Time, Degas Elite and PD disks, all originals, £25 the lot! Phone Pee on (0865)-812903

XL SYSTEM: 800XL, tape recorder, touch tablet, many games and cartridges. Good working order, still boxed and worth over £300 new, will sell for £150 o.n.o. Tel. 0978-358318

XL SYSTEM: 800XL and 1010 data recorder (broken pause key) plus Cheetah 125 joystick with autofire and over £300 worth of software. Will sell for £180 o.n.o. Tel. Wakefield (0924)-382031

XL SYSTEM: 800XL with 1050 disc drive fitted with US Doubler & Spartados, 1029 printer, mint condition still in boxes. Complete with the following software: Mini Office 2, 10-Print, Turbo Basic, Atari Writer, Starquake and lots of PD/Page 6 magazine disks; hardware complete with covers, £250. Tel. 0278-458900 after 6pm

XL PLUS S/W: Surplus 800XL, £30; DOS2.0 manual, £2.50; Mini Office II, £6; Archon, £3; Transpac, £6; Disk Crusher, £3; Gauntlet, £4; Hardball, £2.50; Leaderboard Tournament, £2.50; Pole Position, £2; Winter Olympiad 88, £5; Compute's First Book of Atari, £3; Inside Atari DOS, £3. All software is original, willing to swap all software for Mapping the Atari & De Re atari. Write to: Mark, 23 Saturn Close, Lordshill, Southampton. SO1 8BD

XL SYSTEM: 800XL with brand new XC12 datacorder, joysticks with over 100 games. Bargain at £150 o.n.o. Tel. (0443-85)-3691

XE SYSTEM: 130XE, 1050 disk drive with Happy, 1020 printer plotter, printer interface. Many original disks, cartridges and books, £300 o.n.o. Phone: 0689-27596 (evenings) and ask for David

XE SYSTEM: 130XE computer, £100; 1050 disk drive with s/w and storage box, £120; 72 x 5.25 disks and lockable storage box. Basic XE and disk, printer interface, first 2 vols of Atari User and other books, Atari Writer plus disk. Buyer collects. Tel. (0406)-26150

XE/XL SYSTEM: 130XE, 800XL, 1050 disk drive, Seikosha printer, Graphix interface, touch tablet, plus lots of software too numerous to list (disk & tape). Will split. Offers. Tel. 07683-52091

XL SYSTEM: 800XL with 1050 disk drive, 1029 printer, plus Mini Office 2 and printer software, many games & utilities, £200. Phone 0942-891779 (near Manchester)

XE SYSTEM: 130XE computer with 1050 disk drive, 1027 printer, 1010 tape and 1020 plotter, including 4 ROM games and a collection (40+) of software (business and games). All with original boxes, Page 6 magazines, paper, joystick, only £300, so first come ... Tel: 0372-374228 (Leatherhead, must be able to collect)

XL SYSTEM: 800XL, 1050 disk drive, 1027 printer, Atari Writer, Silent Butler, games, joystick, blank disks, £190 o.n.o. Phone 021-551-3753

ST SYSTEM: 520STFM, with mouse and joystick. Excellent condition, only £250 o.n.o. Phone Richard on Rotherham (0709)-864186

XC12 DATA CASSETTE: Only £15 o.n.o plus £1 post. Standard Atari joystick. £2.00, post free. Some original cassette games for 50p, YES 50p!, also hundreds of cassette holders for free. Contact Garry Crawford, 61 Kenmount Drive, Kennolay, Fife, Scotland. KY8 5LS or drop in any time!

XL SYSTEM: 800XL with 1050 disc drive, data recorder and joystick. 20 games cassettes, 1 ROM and 7 disks including Flight Simulator II and Silicon Dreams. Also 40 disks in lockable box, 10 cassettes, 130XE handbook and loads of magazines, £175. Phone Brian on 0291-423337

CIRCUIT BOARD: For 1027 printer (no mechanical parts), case and P.S.U. Any offers? Buyer collects (Salisbury). Tel. 0722-744162

XL SYSTEM: 800XL, 1050 disk drive, boxed and as new, 7 books including Mapping the Atari, 2 games, joystick, ROM assembler cartridge, Turbo Basic and 20 magazines (Atari User, Page 6, etc). Write to P. Morris, 118A Cranleigh Road, Southbourne, Bournemouth, Dorset, BH6 5JN

SPEECH SYNTHESISERS: Page 6 speech synthesiser, ready built, £17; Maplin Wordmaker speech synthesiser (uses whole words for a better quality speech output); £25, Logic Probe, £6. Tel: 0502-566026

WANTED

INSTRUCTIONS: For Synassembler Assembler, also one Atari User binder. Ring Harry on 0787-473136

DOS GUIDE: An Introduction to the Atari Disk Operating System. £10 for original guidebook; £5 for complete photostat copy. Phone Keith Markland On 0943-600413 (Ilkley)

ST/AMIGA FORMAT: Magazine numbers 2, 3. 4 & 5 with disks (or will supply own blanks). Cover price or less £1.00 (own disks), plus postage. Phone Howard - 0423-879533 after 6pm or weekends

ALTERNATE REALITY: Could someone please sell me Disk 2 of Alternate reality- :The City? Any reasonable price paid. Call 0968-76920 and ask for David

More CONTACT overleaf

CONTACT extra

WANTED

80 COLUMNS: Anyone know of an 80-column utility or ROM which will work with Superscript on the 800XL? Phone Peter on 0625-20782

HELP!: Has anyone got the instruction manual for the 1020 Atari printer? Contact Paul Chandler on 0255-425022 (Clacton, Essex)

MEMORY UPGRADE: For the 800 system or information on where to purchase one. Tel. (0733)-270389 after 6pm

256K DRAM CHIPS: New or secondhand (must be working!). Up to 8 needed. Reasonable price paid. Also, help needed with Rambo XL board. My Antic chip is CO14887 but instructions only mention CO12296 and CO21697 - how do I configure the Rambo board? (My 800XL has a socketed Rev.A PCB). Is the Rambo XL compatible with the O.S. controller card? Contact: Gavin Moran, 18 Roemill Walk, Limavady, Co. Derry, N. Ireland, BT49 9BJ or Tel: 05047-63465 at weekends

DISK DRIVES: One or more drives, working or broken but preferably STD - no Happy mods, etc. Want to get hands on at least four before they die out! Write first instance stating condition. and price - if O.K. I will collect. Contact: Doug Brock, 57 Stonehouse Road, Boldmere, Sutton Coldfield, West Midlands. B73 6LL

DISK DRIVE: 1050 wanted, will pay good price. Tel. 0840-213574

LISTINGS HELP: Get-it-right checksum desperately needed for listings in Atari User prior to Nov. 87. Can anyone help me out with either a tape or disk copy, or a print-out or photo-copy of the listing? Please note that the version needed is NOT GIR II but the earlier one which appeared in the Aug. 86 issue. Mike Parfitt, 11 Lamford Close, London N17

GAME HELP: My name is Marzouk, looking for someone to help me how to reach the final stage in the Strip Poker game, and if there is a program which can show the screens and print them. I welcome anybody who would like to write to me. Marzouk, PO Box 636, Dhahran Airport, 31932, Saudi Arabia

PRINTER: 1029 in good condition with manual, paper and ribbon(s). Telephone: Paul on 0274-615998 after 6pm

PRINTER: 1029 with manual. Phone 0203-441832 after 6pm

DISK DRIVE: 1050 or similar and manual, for 800XL and info on extras, peripherals, etc. Sensible prices paid. Tel. 01-223-1857

ANALOG MAGAZINE: Issue 29, will pay all costs/or swap magazines or software (will accept photo-copy). Contact P.J. Kierans, 66 Newfield Estate, Drogheda, County Louth, Ireland

ATARI USER: Specific issue required - September 1985. Article covering a graphics 8 screen dump for the 1029 printer, needed to convert a 3D program and enable me to print my drawings. Mr. R.S. Smith, 28 Balfour Road, Dover, Kent, CT16 2NQ

PENPALS

8-BIT POWER!: If you still believe in the 8-bit Atari contact me. I'm one of those guys who still thinks that 8-bit Atari are the best computers to have at home. I own a 800XL and a 1050 disk drive. I'm into adventures and shoot-em-ups. Antonio Santos, Rua Don Jose Carcamolobo 41, Lauradio, 2830 Barreiro, PORTUGAL

XL USER: My name is David. I have an 800XL, 1050 disk drive, 1010 tape unit and a 1029 printer. I am interested in all types of software, adventures, arcade games, etc. All letters answered. Write to David Foggin, 49 Johnson Street, Lower Hopton, Mirfield, W. Yorks. WF14 8PQ

ST PENPALS: Wanted to swap hints, info on mostly any adventures. I have completed a number of adventure games. All letters will be answered. Contact T.C. Sinclair, 265, Calder Street, Govanhill, Glasgow, G42 7QG. (041-423-2856)

ST USERS: I own an ST and would like to swap tips and lists with penpals anywhere. All letters answered. Please write to someone across the ocean! Paulette Poshan, 13 Black Partridge Run, Sparland, Illinois 61565, U.S.A

XL PENPALS: I would like to hear from 8-bit enthusiasts from all over the world to swap hints, ideas and programs. I am 14 years old and have an 800XL with 1010 cassette deck. Please write to: Lee Stark, 1 Broadmeadow Green, Stowlawn, Bilston, West Midlands. WV14 0HU

XE PENPALS: I have got an XE and would love to hear from anyone, anywhere. So get a pen and paper and write to me quick! Geraldine Kinane, Templenoe, Greenane, Tipperary, County Tipperary, Ireland

8-BIT USERS: Northern Ireland area; please contact me with a view to setting up a N.I. 8-bit user group. Write to Gavan Moran, 18 Roemill Walk, Limavady, Co. Derry, BT49 9BJ or Tel. 050-47-63465 at weekends. Help support your Atari in Northern Ireland!

XL/XE PENPALS: Hello! I would like to hear from any 8-bit user who is interested in gaming and/or programming. I have a 65XE, XC12 and many games. All letters will be answered. Please write, including your games list, to: Amjid Nuiaz, 53 Cliffe Street, Keighley, West Yorkshire, BD21 2ET

YOUNG ST USERS: I am 12 years old and interested in most ST games, especially Defender Of The Crown, Galdregon's Domain and some good arcade games. I would like to write to anyone with similar interests anywhere in the world. Write to Tim at 32 Merrivale Road, Rising Brook, Stafford, Staffs. ST17 9EB

8-BIT PENPALS: Contact wanted with any 8-bit users. I have a 130XE and 1050 disk drive. I wish to swap hints, tips, etc. All letters answered. Write to: Derek, 1 Bidwell Hill, Houghton Regis, Dunstable, Beds. LU5 5DR

Please keep your notices for CONTACT as short as possible otherwise we may be forced to omit them or severely edit them

CONTACT is FREE of charge and may be used by any genuine Atari enthusiast for contacting other owners. Any notice may be included except those offering software only for sale or exchange or those offering items for sale commercially. The Editor reserves the right to omit any notice received at his discresion.

Send your CONTACT notice to CONTACT, PAGE 6, P.O. Box 54, Stafford, ST16 1DR. Please write your notice on a separate sheet of paper, not as part of a letter.

UPDATE

SUNPLOTTER (ISSUE 37): We tried this program with Turbo Basic before publishing it and found that the PMG's did not work. Thanks then to P. Workman from Birmingham who wrote in with a fix. Change the 17th data statement in line 2270 from 138 to 170. Works a treat but it still doesn't work as a compiled Turbo program.

TURBO BASIC: Ghislain De Graeve from Belgium has given us a great hint on TURBO BASIC. Going to DOS meant that you have had to re-boot but if you have MEM.SAV on your disk and select item M from the DOS menu and enter the address 2080, hey presto, you are back to Turbo Basic!

AMAZING (ISSUE 37): Several readers have written to say that this gives Error 3 at line 500 when exiting the third screen. We haven't had time to solve this yet, anyone got a fix?

BLASTCOM (ISSUE 37): The program does work as listed but several readers had problems in tracking down errors in their typing. Blair Sutton wrote to point out that line 250 should be amended to

```
250 FOR LINE=410 TO 1390 STEP 10
```

It does not make any difference if you type the program correctly but if you have an error, then the program will tell you the error is in totally the wrong place! The program had obviously been renumbered and shows the perils of renumbering a working listing unless you are very, very careful.

BEST SINCE STAR RAIDERS!

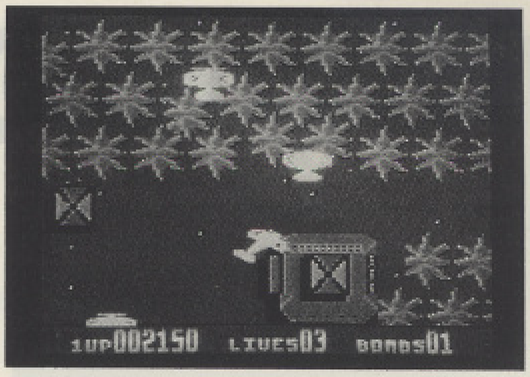
Prepare for some exciting news! Atari have produced a brilliant new game that can only be described as their BEST EVER 8-bit release since the legendary Star Raiders!! TIGER ATTACK is a conversion of the coin-op arcade game Flying Shark which runs along similar lines to the older arcade hit '1942'. If you've experienced Red Rat's Screaming Wings then you'll know what this game is all about.

It's a vertically scrolling shoot 'em up set in the closing months of the Second World War. Allied Fighter Command have called upon you - an ace combat pilot - to flush out the remaining Japanese forces from the jungles and islands of the South Pacific. Your mission is to skilfully pilot a small aircraft through the treacherous war-zone and pulverise as many of the enemy's fighters, tanks and gun emplacements as possible. The battle is viewed from directly overhead, with your plane initially located in the centre of the display. In addition to the continuous vertical scrolling, there's a small amount of horizontal scrolling too. Your plane can move quickly to any position on the screen, an ability you'll be glad of once the endless waves of Japanese fighter planes commence their relentless attacks!

Title: TIGER ATTACK
Publisher: Atari Corp.
Price: £7.99 on cassette.
Players: 1/2
Control: Joystick(s)

As in most games of this type, Smart bombs are available for escaping from those really tricky situations when all else has failed. Bad news for anyone who is hoping to give their autofire joystick a work-out is that the bombs here are launched by a combination of joystick movement and trigger press, making it all too easy to fire one inadvertently. I suspect that the more traditional space bar approach was avoided so as not to disappoint XE games system owners who might not have a keyboard. Extra bombs are obtainable by flying over 'B' symbols, and it's also possible to increase your fire power by similarly collecting 'S' capsules. Very useful these!

One or two player modes are selectable from the title screen, as is the number of joysticks to be used in a two player game.



You can also opt for either music or sound effects to accompany the action - both are excellent, although I preferred the music which seemed to add considerable atmosphere to the game. Sharp, detailed graphics are a feature of Tiger Attack that contributes greatly to an overall high standard of presentation. A highscore table is included to round off a list of good features that all add up to form a tremendously enjoyable and addictive piece of software.

Although it's more expensive than many other games currently on the market, I believe the price is fully justified by the superlative quality of the end product. Remember that ST owners are paying £25 for a similar game and you'll realise that Tiger Attack is a bargain just too good to miss. Highly recommended!

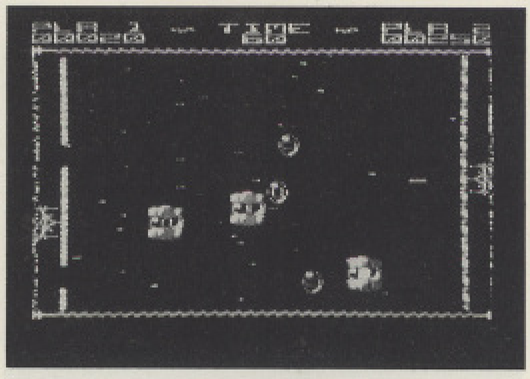
Paul Rixon

GO AWAY AND FIGHT IT OUT

NUCLEUS is the first in a new line of budget priced software from Atari Corporation that is to include both existing and previously unseen titles under the common label of 'Atari Action Games'.

Although it's essentially yet another variation of the ever-popular shoot 'em up theme, the design is actually quite original. We're told that inter-planetary warfare has been prohibited by the ruling Intergalactic Federation and that all disputes must now be resolved at a distant region of the galaxy known as the OMAC combat arena. Not surprisingly, this arena is the setting for a game in which you attempt to defeat an alien aggressor. If you can't find a suitable human opponent then a computerised alternative is willingly supplied.

The competing space craft are located at opposite edges of a single screen, each accompanied by a forcefield on one side and a protective Titanium shield on the other. The craft are restricted to vertical movement only but they can also fire energy bolts at nuclear satellites floating around in the area between them. The general idea is to persistently bombard the satellites with missiles until they eventually begin to disintegrate into several smal-



ler pieces and, finally, into a nucleus which can be directed at a player's Titanium Shield. The resulting collision causes a small hole to appear in the shield, and if the opponent can direct a satellite through this gap and into the player's forcefield, the battle is over.

It may not sound like one of the most exciting games around but in fact it turns out to be a strangely addictive experience where one player can do all the work, only to see the opponent receive all the benefit by a sudden and unexpected turn of fortune. It's simply impossible to predict a winner right up until the very last moment, and when that moment comes, you'll immediately want another go to prove that it wasn't just a fluke! The computer is reasonably easy to beat on the lower levels but four difficulty settings are provided, ensuring a suitable challenge for players of all abilities. Unfortunately, there appears to be no automatic progression onto the higher levels once a battle has been won - the game simply stops, regardless of the victor. One hopes that this is only a characteristic of the pre-release review copy.

Sound is somewhat reminiscent of Atari's early 8-bit efforts - rather a disappointment after the super effects of Thunderfox. Graphics are generally pleasant - mainly thanks to a scrolling starscape background which, together with the nicely animated satellites, forms the bulk of the visual display. Nucleus is an original, challenging and above all, immensely addictive game that seems particularly enjoyable in two player mode. It's nice to see something new from Atari and at a sensible price too!

Paul Rixon

Title: NUCLEUS
Publisher: Atari Corp.
Price: £2.99 on cassette
Players: 1/2
Control: Joystick

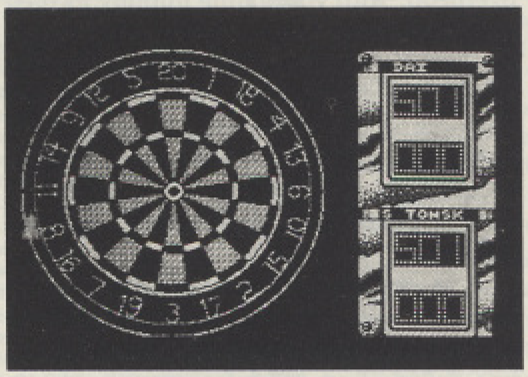
GAME ON ...THROW THEM ARROWS

Darts buffs are in for a treat with this newest addition to Zeppelin's budget range - JOCKY WILSON'S DARTS CHALLENGE is packed with a host of features and options unsurpassed by any previous simulation of its kind.

First thing to make clear is that it's definitely not aimed at anyone who isn't reasonably adept with a joystick. You don't need to be an ace darts player, but you do need the ability to manipulate a tiny dart symbol that moves continuously in a most erratic fashion - generally in the opposite direction to the one you are trying to coax it into! It makes Mastertronic's '180' seem like a nursery school exercise!!

There are basically three modes of play, each with further options that are initialised via a novel icon selection screen.

Title: JOCKY WILSON'S DARTS CHALLENGE
Publisher: Zeppelin Games
Price: £2.99 on cassette
Players: 1/4 with Joystick



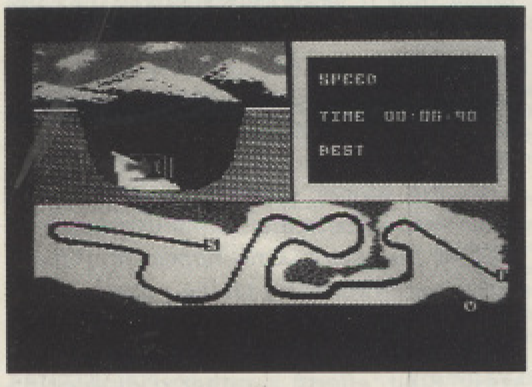
Tournament mode enables up to four players (who must share a single joystick) to compete against a variety of computer generated opponents before a final confrontation between the remaining player and Jocky Wilson himself. Round the Clock mode serves as a useful practice facility as you try to hit each sector of the board in numerical order in the shortest possible time. To complicate matters, you can instruct the computer to accept trebles, doubles, singles or any number as a valid 'hit'. If you simply want a standard game against a human opponent, you can make use of the Head to Head option. A further choice in this section is the number of sets over which you intend the game to last, up to a maximum of four.

For anyone not too sure about the mathematics involved in determining the quickest or easiest way to finish, there's an optional tutor that informs you of a suitable score to attempt. Whether you can actually get the dart to go anywhere near that recommendation is of course an entirely different matter! Some alternative levels of difficulty might have been a good idea.

Play centres around a high resolution dart board, but when it's the computer's go, the display changes to an overhead view of the proceedings, in a similar colouring to the corresponding screen in '180'. Superb is an accurate description of the graphics throughout. One aspect of Darts Challenge conspicuous by its absence is, surprisingly, sound! After a brilliant opening composition, an eerie silence descends upon the game and there isn't so much as a beep until you next return to the title page. Not like a Zeppelin game at all!

A final point to note is that the loading time from cassette is around twenty minutes! If you're mad about darts you will surely find it worth the wait but I do think that software of this nature should be available on disk if it's to appeal to games players in general. Are you listening Zeppelin?!

Pauk Rixon



PLAYING IN THE SNOW

Anco are back - after almost three years - with their second release for the Atari 8-bit - WINTER EVENTS. Just the thing for a warm summer evening!

It begins in the traditional fashion with an athlete lighting a flame to herald the start of competition. You can choose to either practice or compete in any or all of the available events, by yourself or with up to three other players. Each is required to select a nationality from ten alternatives supplied - a novelty that soon wears off and unfortunately, you can't skip over it but have to wait for the playing of each appropriate national anthem.

There are five events - Speed Skating, Ski Jump, Slalom, Bobsled and Biathlon. Thankfully, there isn't too much of an emphasis on that destructive joystick waggling associated with older sports simulations such as Decathlon. In the Speed Skating event for instance, it's important to keep the joystick moving at a steady rate rather than a particularly fast one. The objective here is to skate a distance of 300 metres in the quickest possible time. Not one of the most rivetting experiences this, but animation of the skier is well done and sound is good too - as in all the events, a super tune plays prior to the start of any action. A similar joystick technique applies in the Biathlon. After contending with several screens of snow-bound scenery, you arrive at a shooting range and must aim to hit five small targets with an equal number of shots.

The Slalom will appeal to those people who like to exercise their reflexes. As you'd expect, it involves steering a skier - who is viewed from behind - through a series of gates at break-neck speed. This can be adjusted to suit your steering ability but miss more than three gates and you face disqualification. In the Ski Jump your aim is, obviously, to jump as far as possible but there are points awarded for 'style' too as you try to match your posture against an 'ideal' image displayed alongside throughout the jump. Graphics in this section are excellent. Last of all is my personal favourite of the five events - the Bobsled. Here, a split screen depicts an overhead perspective of the twisting course plus an end view of your bob as it hurtles through the ice at an ever-increasing velocity. It's an enjoyable, but admittedly not too difficult experience.

In case you've developed a feeling of deja vu, I can assure you that Winter Events is NOT a re-release of Tynesoft's Winter Olympiad '88, although the two are remarkably similar in content. Tynesoft's game beats Anco's in the graphics department, but then it is also more expensive. Winter Events has good music, plenty to keep you occupied and enables the whole family to participate - a splendid effort from Anco!

Paul Rixon

Title: WINTER EVENTS
Publisher: Anco
Price: £7.95 cass./£9.95 disk
Players: 1/4
Control: Joystick and Keyboard

SIX YEARS WITHOUT A BLAST

'It has been six years since you took on the alien fleet single handed, obliterating their asteroid bases, turning their mother-ships into expanding clouds of vapour, grabbing those pieces of extra hardware for your trusty ship. Those were the days...'

But just when you thought is was safe to take a shower, the mighty Intergalactic Federation have called you up from retirement and insist that you embark on a new deadly mission. It seems that enemy forces have captured Tanium - the second most strategically important planet this side of the Sanvolgrani Rift and - yep, you guessed it folks! - it's a chance to climb aboard your Quariad Stealth Fighter and give those meanies hell!!

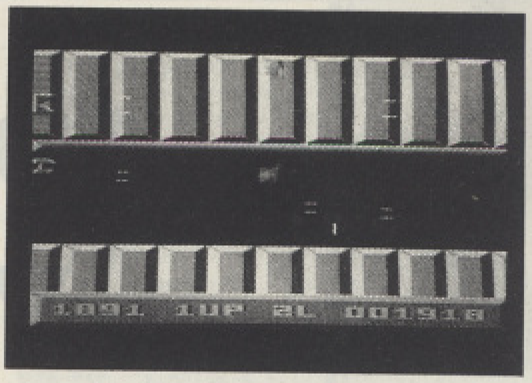
As you might have realised by now, Players' TANIUM is a fast-paced action shoot 'em up of the horizontally scrolling variety

Title: TANIUM
Publisher: Players
Price: £1.99
Players: 1/2
Control: Joystick(s)

- but don't stop reading yet, as it includes one or two features that you probably won't have encountered before. The main difference is the unusual control of your Stealth Fighter, which is viewed in not one but two alternative perspectives via a split scrolling display. In the upper half there's a bird's eye picture of the action so you can line up with oncoming enemy ships by a sideways movement of the joystick. Underneath is a corresponding side-on view and here you control the ship's altitude in order both to intercept the nasties and to avoid various static obstacles - all cunningly devised to make your chances of survival pretty remote. On the higher levels, further obstacles are added in both perspectives, making life very tricky indeed!

It's no simple task trying to simultaneously manage both aspects of your craft's position but mastering the necessary technique is essential if you are to progress any further than the first of the ten pre-selectable levels available, let alone obtain a place in the highscore table!

The author appears to have made every effort to incorporate 'user friendliness' into the game wherever possible - something I



particularly appreciate. For instance, there's a demo mode to show you how it ought to be done and you also have the ability to abort the mission at any time, still retaining your current score. Sound effects throughout are of a very high standard and two pieces of music accompany the title screen and highscore table respectively. Graphics are also very well designed with some clever shading of the kind found in similar shoot 'em ups such as Mirax Force and Thunderfox. The speed of play is not affected by the large amount of movement on each screen - both scrolling and animation are perfectly smooth.

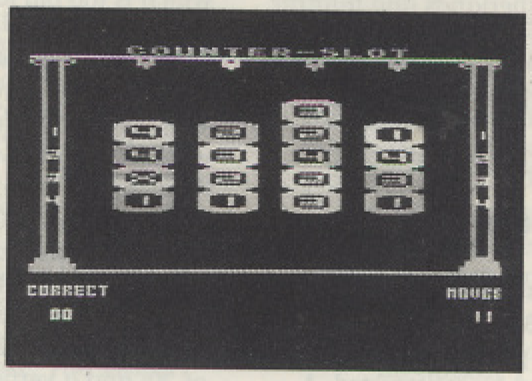
Tanium has been around for quite a while now so if you missed it and are 'into' zapping things then be sure to make amends at the earliest opportunity. Players are offering terrific value for money.

Paul Rixon

STEP ASIDE MR RUBIK

Here's a challenge for all those mega-minded logic fanatics out there whose talents include such things as being able to solve a Rubik's Cube in less time than it takes the rest of us to remove it from the box! COUNTER-SLOT is the name of a computerised version of a similarly mind-boggling puzzle from a small 'independent' software publisher called Amethyst Software. Amethyst appear to specialise in games of this type and a feature of their budget priced publications is that they all come supplied on a TDK C60 cassette, so even if you can't stand the program, you've still bought something useful!

The aim is reasonably straightforward (isn't it always?). All you have to do is rearrange sixteen multicoloured tiles into a specified order in as few moves as possible. Each row is labelled with a number, one to four, and each column with a colour (the Atari defaults). The tiles are similarly numbered and coloured leaving you in no doubt as to their intended positions. There's also an extra tile to help you get started - at least I think that's what it's for! The top and bottom rows are left clear so that you can slide the entire columns either up or down and additionally move the top or bottom tile in any particular



column onto any of the three remaining columns. It's easier to play than it is to explain, but completing it is something different again!

Should you finally solve the puzzle, you'll be informed that the game was especially designed to push those who attempted it to 'anger, frustration and eventually, madness'. Personally I think the 'music' accompanying the rather lengthy and unfortunately unavoidable opening sequence is the only thing likely to do that!! Also slightly annoying is the fqct that once you have solved it, you have to re-boot the cassette if you want to play again. On second thoughts, perhaps the chances that you'll want another go are pretty remote anyway!

Well, what else can I say about Counter-Slot? It's an interesting puzzle. It's not what you'd call an outstanding feat of programming by any stretch of the imagination but then, not everyone likes blasting aliens and this could be the ideal game for them. If you're a fan of those sliding tile picture puzzles or if you're one who marvels over inventions from the likes of Mr Rubik then it's definitely up your street. Unlike the famous cube, you can't of course 'solve' it by prising the pieces apart with a screwdriver! It takes skill, logic, and above all, patience to crack the Counter-Slot puzzle.

You are unlikely to find Counter-Slot in the shops but it's available direct from Amethyst Software whose advertisement you will find among the pages of this magazine.

Paul Rixon

Title: COUNTER-SLOT
Publisher: Amethyst Software
Price: £4.99
Players: 1
Control: Joystick

TURBO BASIC

A TUTORIAL SERIES BY GORDON CAMERON

3. MORE POWER TO YOUR GRAPHICS

In this instalment Gordon Cameron discusses the CIRCLE, FCOLOR, FILLTO and PAINT commands and provides examples of these combined with the powerful MOVE command

I'd like to start this issue by thanking all those who wrote to me in response to the first articles. It's great to know that someone actually bothers to read what I write! It's always interesting to know what you think so, please, continue to write to me, and I'll reply as soon as I can. Many of you have asked where you can get the language. It's available from most PD libraries, but PAGE 6 supply the language, compiler, and short guide from their Accessory Shop for the very reasonable price of £3.95 (see inside front cover).

Dennis Fogarty of Salisbury wrote with his comments and ideas, both of which I appreciated immensely. Mr. Fogarty suggests that I devote some space to readers' queries each issue, and I agree that this is a good idea. I hope to start this when I get a few more questions, so I can bundle them together in one article.

If you remember, I said that it was necessary to reboot Turbo Basic after entering DOS. Another reader, John Carter, reckons that this is not so. In his own words, 'To return to TB after formatting etc, choose option M and type in 2080'. Unfortunately, this doesn't seem to work on my 800XL. Perhaps it does on other machines? (It works on the 130XE but the start address will be a few bytes different on the XL, perhaps someone can work it out? Ed.) Incidentally, Mr.Carter hails from The Hague in The Netherlands and informs me that TB is, and has been for some years, very popular on the continent. Perhaps some other of our foreign friends would like to write, to add to the international flavour ?

Anyway, on to the business at hand ...

TURBO BASIC and GRAPHICS

As well as supporting the standard 'Basic' Atari graphics functions, Turbo Basic also supplies us with 6 more commands to play with. Circles, ellipses and 'true' circles can be constructed. A command is supplied to clear the screen easily, and three instructions are included which can be used to fill in shapes. Text can be displayed on screen in graphics modes, and I finish off with an instruction which, although not strictly a graphics one, is ideal for that purpose.

Listings 1 and 2 show the following commands in action. In listing 2, START/SELECT scrolls the screen, whilst OPTION and the space bar perform special effects!

DRAWING CIRCLES, ELLIPSES, AND TRUE CIRCLES

At last - a way of drawing circles easily! The command works in any of the graphics mode, and has the format **CIRCLE** X, Y, R where X and Y are the coordinates of the circle's centre, and R is the radius. So, for example, if you choose COLOR 1 in graphics mode 8, then CIRCLE 160, 96, 75 will draw a circle with radius 75 in the middle of the screen.

If the radius you supply means that part of the circle will be off the screen, then don't worry! Turbo Basic will only draw the part(s) of the circle which is/are visible. So, for example, if you tried CIRCLE 50, 50, 75 in GR.8 only the visible parts of the circle, which is too big for the screen, will be displayed.

The second form of the **CIRCLE** command has a fourth argument, which allows you to choose different horizontal and vertical radii. Obviously, theoretically, a circle has a constant radius, so if you make the radius 'across-the-way' (horizontal) and the radius 'down-the-way' (vertical) different, then you get a skewed, or stretched circle, which is known as an ellipse. The format of the command is CIRCLE X, Y, R1, R2 with R1 being the HORIZONTAL radius, and R2 the vertical radius. So, in GR.8 CIRCLE 160, 96, 45, 20 draws an ellipse in the middle of the screen with radius across 45, and radius down 20, whilst CIRCLE 160, 96, 20, 45 is an ellipse with a HORIZONTAL radius of 20, and a vertical one of 45. If you make both the same, then you have a circle, so this is the same as missing out the last argument, i.e. if r1 and r2 are equal, then CIRCLE x, y, r1, r2 is the same as CIRCLE x, y, r1.

This leads me on to a bit of a moot point. When you use the circle command to draw circles you may not, in certain modes, get 'proper' circles! But how can a circle not be a circle? Well, the circles that TB draws do indeed have the same radius in PIXELS all the way round. However, there are differing numbers of pixels across the screen and down, so pixels may *not* have the same width and height, and a distance of 50 pixels horizontally may be *different* to a distance of 50 pixels vertically. So your circle may appear stretched out of shape, and not a circle at all!

In certain modes, this effect is not really noticeable. For example, in GR.8, there are 320 pixels across, and 192 down. The ratio 320/192 is a good approximation to your TV ratio, and is therefore the correct shape, so circles appear as circles. In GR.9, however, there are 80 pixels across and 192 down. This is

```
IL 1 REM ##################################
DB 2 REM #    TURBO BASIC TUTORIAL 3    #
PD 3 REM #      by Gordon Cameron        #
AH 4 REM #          for PAGE 6           #
SM 5 REM #          LISTING 1            #
LC 6 REM #      ATARI XL/XE ONLY         #
IR 7 REM ##################################
NN 8 REM
DT 100 GO# MAIN
OO 110 ------------------------------
OS 120 ------------------------------
DA 130 PROC SETUP
ZI 140   DIM BLANK$(40)
YO 150   DIM ST$(60)
IN 160   FOR LOOP=1 TO 40:BLANK$(LOOP)=CH
   R$(0):NEXT LOOP
FH 170   BLANK=ADR(BLANK$)
PK 180   GRAPHICS 24
KM 190   SETCOLOR 2,0,0:SETCOLOR 1,14,14
UO 200   COLOR 1
PV 210   DEG
DM 220   SCREEN=PEEK(88)+256*PEEK(89)
VQ 230 ENDPROC
OX 240 ------------------------------
OZ 250 ------------------------------
OO 260 PROC LETTERS
BA 270   FOR LOOP=1 TO LEN(ST$)
KT 280     TEXT LOOP*8+G_X,G_Y,ST$(LOOP,L
   OOP)
AX 290     FOR LOOP2=14 TO 0 STEP -1:SOUN
   D 0,100,2,LOOP2:NEXT LOOP2
ZM 300   NEXT LOOP
VN 310 ENDPROC
OU 320 ------------------------------
OW 330 ------------------------------
OK 340 PROC FADE1
HH 350   FOR LOOP=0 TO 7960 STEP 80
SF 360     MOVE BLANK,SCREEN+LOOP,40
ED 370     MOVE BLANK,SCREEN+7960-LOOP,40
AC 380   NEXT LOOP
WD 390 ENDPROC
OR 400 ------------------------------
OT 410 ------------------------------
QV 420 PROC FADE2
ME 430   FOR LOOP=0 TO 7960 STEP 80
SC 440     MOVE BLANK,SCREEN+LOOP,40
ZK 450   NEXT LOOP
MW 460   FOR LOOP=7960 TO 0 STEP -80
SI 470     MOVE BLANK,SCREEN+LOOP,40
AD 480   NEXT LOOP
WE 490 ENDPROC
OS 500 ------------------------------
OU 510 ------------------------------
RK 520 PROC FADE3
HF 530   FOR LOOP=0 TO 7960 STEP 80
SD 540     MOVE BLANK,SCREEN+LOOP,40
ZY 550   NEXT LOOP
YW 560   FOR LOOP=40 TO 7960 STEP 80
SJ 570     MOVE BLANK,SCREEN+LOOP,40
AE 580   NEXT LOOP
WF 590 ENDPROC
OT 600 ------------------------------
OV 610 ------------------------------
ZM 620 PROC CIRCLES
GP 630   ST$="PAGE   -   SIX"
HD 640   G_X=90:G_Y=92:EXEC LETTERS
HN 650   FOR LOOP=0 TO 480 STEP 7
KR 660     L=LOOP/3:S=SIN(LOOP)
TO 670     CIRCLE L,LOOP/4*(S*S),10
KK 680     CIRCLE 320-L,192-LOOP/4*(S*S),
   10
AH 690   NEXT LOOP
YB 700   EXEC FADE1
CG 710   ----------------------------
AN 720   ST$="CIRCLE/TEXT/MOVE DEMO..."
CN 730   G_X=80:G_Y=183:EXEC LETTERS
VS 740   ST$="(WITH SOME TERRIBLE SOUND!)
   "
GT 750   G_X=0:G_Y=0:EXEC LETTERS
KQ 760   FOR LOOP=960 TO 0 STEP -6
KU 770     L=LOOP/3:S=SIN(LOOP)
AB 780     CIRCLE 320-L,100*(S*S)+L/3,10
AI 790   NEXT LOOP
YS 800   EXEC FADE2
CI 801   ----------------------------
CX 810   G_X=10:G_Y=10:ST$="A FEW":EXEC L
   ETTERS
IP 820   G_X=240:G_Y=10:ST$="MIXED":EXEC
   LETTERS
LZ 830   G_X=10:G_Y=173:ST$="CIRCLES&":EX
   EC LETTERS
TA 840   G_X=230:G_Y=173:ST$="ELLIPSES":E
   XEC LETTERS
EF 850   FOR LOOP=4 TO 96 STEP 12
EY 860     CIRCLE 160,96,LOOP
PS 870     CIRCLE 160,96,LOOP,LOOP+12
DU 880     CIRCLE 160,96,LOOP+12,LOOP
AJ 890   NEXT LOOP
ZJ 900   EXEC FADE3
CJ 901   ----------------------------
FR 910   FOR LOOP=5 TO 100 STEP 5
YK 920     CIRCLE 160,100,LOOP+(LOOP/3),L
   OOP
ZY 930   NEXT LOOP
WD 940   ST$="AND...SOME PLAIN SIMPLE OVA
   LS..."
FN 950   G_X=30:G_Y=93:EXEC LETTERS
UB 960   PAUSE 20
ZH 970   EXEC FADE2
WH 980 ENDPROC
PO 990 ------------------------------
XC 1000 ------------------------------
ST 1010 # MAIN
KD 1020 EXEC SETUP
JZ 1030 DO
NY 1040   EXEC CIRCLES
MB 1050 LOOP
```

Listing 1

rectangular in the WRONG direction as regards the display! So circles seem to be skewed across the way to a very large extent. Try CIRCLE 40, 96, 35 to see what I mean.

If you may want to display your circles as 'true' circles in, say, mode 9, then a way to do this is to alter either the horizontal or vertical radius, keeping the other the same. If you keep the radius across the way a constant, then you want the vertical radius to be increased to compensate, as the pixels are longer than they are tall. So, you need more vertical pixels. How many more? Well, this depends on the dimensions of your display device. Experiment by multiplying the vertical radius by numbers between 1 and 3 - CIRCLE 40, 96, 35, 35*(192/80) is an improvement over the earlier simple circle in GR.9, but I suggest you try for yourself, and take a look at Listing 2, which tries to draw near circles in that mode.

Other modes may require you to multiply one of the radii by a different number. Practice makes perfect, is the only advice I can offer so try it out in different graphics modes.

Never mind if you don't follow all of the above. The simple CIRCLE will work very nicely almost all of the time.

CLEARING THE SCREEN

At last - a *simple* way to clear the screen. Personally, this simple command is one of the most welcome commands to be included. In Atari Basic, you had to use PRINT CHR$(125) (or PRINT "<up arrow>") to clear the screen. Now you need simply type **CLS**, and hey presto, the screen is cleared.

A refinement is also included, in that if you open the screen as a channel, you can clear it by means of CLS #<channel number>. For example, say you have opened the screen in channel 5, then CLS #5 will clear the screen.

FILLING ENCLOSED AREAS

Turbo Basic allows you to easily fill in any circles, squares or any other shapes with the colour you want. Many of you may remember an obscure way of doing this in Atari Basic. You had to position the cursor inside the shape by using POS. X, Y. Then, you issued the obscure command XIO 18, #6, 0, 0, "S:". This filled the shape alright, but wasn't very descriptive or easy to remember.

In Turbo Basic, you first choose the colour you want to fill with, using FCOLOR n, replacing n by the required colour. Then FILLTO x, y has the same effect as the Atari Basic POS followed by XIO, but it is a lot easier to follow. However, this fill is not perfect, as some shapes aren't filled properly. That is, giving a start point inside the shape is not a guarantee that it will completely fill the shape. Even slightly complex shapes present a problem for FILLTO, unless you know which points to choose, so TB provides us with another command PAINT x, y which does the same thing essentially, but uses a different, recursive algorithm. A quick example

```
10 GR.8
20 COLOR 1
30 CIRCLE 160, 96, 40
40 FCOLOR 1
```

You can now have a line 50 which either reads PAINT 160, 96 or FILLTO 160, 96. Try both. Here you can see the weakness of FILLTO - it needs you to specify 'correct' point(s), otherwise the object won't be filled correctly. PAINT, on the other hand, just requires you to choose *any* point inside the shape. Try experimenting with both on simple, and more complex objects to see their relative strengths and weaknesses, in terms of speed and performance.

A word of warning. Both algorithms work by noting the background colour, and go on to change the start point you choose and consecutive neighbouring points *of the same colour as the background* with the new fill colour. If a pixel is a different colour from that of the background, it remains unchanged. So different colours act as a boundary. Make sure you enclose *completely* the area you want to fill, or the colour may spill/bleed to other parts →

of the screen. You have been warned!

PUTTING TEXT ON THE GRAPHICS SCREEN

In Atari Basic, displaying text messages on GRAPHICS screens was difficult. This was a pity, as it meant that annotating graphs, diagrams and pictures was difficult. Not any more! Turbo Basic allows you to place a string of characters anywhere on the graphics screen. The format is TEXT x, y, text$, where (x, y) is the top left corner of where the first character of text$ will be put. For example, in Graphics mode 8

```
10 GR.8
20 COLOR 1
30 PLOT 0, 93: DRAWTO 319, 93: DRAWTO 319, 107
40 DRAWTO 0, 107: DRAWTO 0, 93
50 TEXT 80, 96, "Hello There folks!!"
```

Those of you in the know will no doubt realise that the text is 'bit-blocked' at the screen location given. The size of the text will differ from mode to mode, and some modes give interesting effects when you mix case and include inverse characters in the string to be displayed. Remember, TEXT is meant for graphic modes, as PRINT will do for text modes. I'll leave you to experiment yourselves.

MOVING BITS OF THE SCREEN ABOUT!

The **MOVE** command is more of a general command than a graphics one, though it is very useful in the latter case for many things, including:

* Moving chunks of the screen around (See Listing 2, and Program 2 from last issue's article)
* Replicating bits of memory/graphics (See the screen fades in Listing 1)
* Simple animation, including page-flipping (a technique where the screen image is copied to the background, altered, then switched back to the foreground again, and so on) - not within the scope of this article!

I have used **MOVE** in quite a few of my programs without describing it, so I thought I'd better give a brief outline of what I am doing. If you don't follow - DON'T WORRY, and just skip past this bit and the next section. I'll describe it fully in a future article - hopefully!

What **MOVE** actually does is take a chunk of memory of a certain length in bytes and *copies* it to a new location. The actual format is

MOVE source, destination, numbytes

where source and destination are the addresses in memory where the 'chunk' comes from, and where it is going to be copied to, respectively. numbytes is the length of the 'chunk' in bytes.

SOME TECHNICAL STUFF

In graphics work, the source and destination addresses are actually places on the screen. To calculate the start of screen memory, use PEEK(88)+256*PEEK(89), or DPEEK(88) as your base. You then have to work out how many pixels there are in a byte. This varies from graphic mode to mode - Graphics 8 is what is known as bit-mapped, where each pixel corresponds to 1 bit. Other modes have colour, so it is not enough to say whether or not a point is set - the COLOUR of the point must be stored. So, in multi-colour modes, perhaps 4 bits are used to store each point (this arrangement can handle up to 16 colours). I'll stick with GR.8 for this example. There are 8 bits in a byte, so this mode has 8 pixels in a byte. This is the *smallest* size segment that can be moved, so if you move the screen, it can move *only* in multiples of 8 pixels. The GR.8 screen is 320 pixels across, so it is 40 (320/8) BYTES across. So, to move a screen line, the 3rd parameter of the MOVE command will be 40. All you have to do now is to work out where your line is coming from, and where it's going to. You can choose any line in GR.8 by simply multiplying the row number by 40 (the number of bytes in a row - remember?), and adding this to the start of screen memory. So, to copy line 0 to line 1 in GR.8, you could do

```
10 START=DPEEK(88)
20 MOVE START, START+40, 40
```

To copy from line 4 to 5:

```
20 MOVE START+(40*4), START+(40*5), 40
```

and so on ....

Phew!! What am I on about ? Well, there is method in my madness, in that Listing 1 fades the screen by using the above method to copy a blank line (represented by 40 bytes, all with value 0) to different rows, blanking or fading out bits of the picture. This is the same as DRAWing a black line, but is a LOT faster, Try changing the program so that the fade procedures erase rows by drawing a black line and you'll see what I mean!

Where does the move command get the blank line from though? Well, I've defined a string array of 40 in length, and filled it with zeroes. I then use the command ADR to find where the string is stored. I can treat this as a sequence of 40 bytes so it is, to all extents and purposes, a blank GR.8 line. These 40 bytes are then copied to the screen. Voila! The same technique can be applied to different screen modes, but, again, I'll leave this to you as an exercise (I sound like a teacher! 'Make sure it's handed in on time'!).

The entire screen scrolling effect in Listing 2 was achieved in a similar way. I'll maybe describe exactly how next issue. I'm sorry if I've lost some of you with a 'technical' description, but there is no other way I could describe the technique.

BACK TO REALITY

To finish off this issue, some quick general commands. Remember the Atari Basic function TRAP <lineno>? What this does is, when (or should I say if?) an error occurs, the program will jump to the line number given and continue from there. Turbo Basic also supports **TRAP** #label which will do exactly the same, but jump to a label rather than a line number.

In addition, you can make use of the reserved variables **ERR** and **ERL**. ERR contains the VALUE of the last error which occurred, whilst ERL lets you know of the line where it occurred. So, you could have

```
10 TRAP #ERROR
----
----
9000 #ERROR
9005 GR.0
9010 PRINT "ERROR - Number is ";ERR;" at line
";ERL;"."
9020 STOP <or whatever you want to do>
```

That should be enough to be getting on with for this issue! Next time I hope to cover the new arithmetic commands, and some more general ones. Let me know if you want me to try and talk about anything that particularly interests you, and what you think. Write to me **Gordon Cameron, c/o 13 Muir Bank, Scone, Perthshire PH2 6SZ, SCOTLAND.**

TURBO BASIC TUTORIAL Listing 2

```
IL 1 REM ######################################
DB 2 REM #    TURBO BASIC TUTORIAL 3  #
PD 3 REM #      by Gordon Cameron     #
AW 4 REM #          for PAGE 6        #
TL 5 REM #          LISTING 2         #
LC 6 REM #       ATARI XL/XE ONLY     #
IR 7 REM ######################################
NN 8 REM
DJ 10 GO# MAIN
HX 20 ----------------------------------
HY 30 ----------------------------------
RT 40 PROC INTRO
DZ 50   CLS
VP 60   POSITION 8,2:? "GRAPHIC FX by G.C '89"
BI 70   POSITION 8,3:? "---------------------"
FS 80   POSITION 7,6:? "OPTION - 'Door' effect"
EA 90   POSITION 7,8:? "SELECT - Scroll Up"
GF 100   POSITION 7,10:? "START  - Scroll Down"
ZB 110   POSITION 7,12:? "SPACE  - Bounce effect"
MK 120   POSITION 6,20:? "Press any key, then wait.."
UD 130   WHILE INKEY$="":WEND
VR 140 ENDPROC
OY 150 ----------------------------------
PA 160 ----------------------------------
UO 170 PROC SPECIAL
AC 180   SOUND 0,255,2,6
WX 190   FOR LOOP=0 TO 3840 STEP 40
JA 200     MOVE WHERE+3840-LOOP,START,LOOP
SI 210     MOVE WHERE+3840,START+7680-LOOP,LOOP
ZP 220   NEXT LOOP
NZ 230   FOR LOOP=14 TO 0 STEP -1
AB 240     SOUND 0,255,8,LOOP:SOUND 1,254,4,LOOP
VZ 250     SOUND 2,250,6,LOOP
UG 260     POKE 704,LOOP:PAUSE (LOOP+2)/2
ZZ 270   NEXT LOOP
QN 280   DSOUND
KY 290   INC=0
VL 300 ENDPROC
OS 310 ----------------------------------
OU 320 ----------------------------------
EO 330 PROC BOUNCE
TC 340   FOR LOOP=START TO START+6560 STEP 40
DF 350     MOVE MSG,LOOP,1120
ZY 360   NEXT LOOP
SE 370   FOR LOOP=START+6520 TO START+40 STEP -40
DL 380     MOVE MSG,LOOP,1120
FN 390     MOVE WHERE+LOOP-START+1080,LOOP+1080,40
ZM 400   NEXT LOOP
JP 410   FOR LOOP=80 TO 3320 STEP 40
MB 420     MOVE MSG,START+LOOP,1120
DP 430     MOVE WHERE+LOOP-40,START+LOOP-40,40
ZV 440   NEXT LOOP
LF 445   INC=0
VW 450 ENDPROC
PD 460 ----------------------------------
PF 470 ----------------------------------
VE 480 PROC KEY
DH 490   IF NOT (PEEK(53279)&1)
BH 500     MOVE WHERE+7680-INC,START,INC
IQ 510     MOVE WHERE,START+INC,8130-INC
IN 520     INC=(INC+80) MOD 7680
XU 530   ENDIF
DZ 540   IF NOT (PEEK(53279)&2)
BR 550     MOVE WHERE+7680-INC,START,INC
JA 560     MOVE WHERE,START+INC,8130-INC
AN 570     INC=(INC-80) MOD 7680:IF INC<0 THEN INC=7680
YE 580   ENDIF
GL 590   IF NOT (PEEK(53279)&4)
VS 600     EXEC SPECIAL
XR 610   ENDIF
XW 620   IF INKEY$=" "
VO 630     EXEC BOUNCE
XX 640   ENDIF
VY 650 ENDPROC
PF 660 ----------------------------------
PH 670 ----------------------------------
DP 680 PROC SETUP
PW 690   DIM FLIP$(8130)
FV 700   DIM MSG$(1120)
II 710   WHERE=ADR(FLIP$)
AN 720   MSG=ADR(MSG$)
MA 730   GRAPHICS 10
RB 740   FOR LOOP=0 TO 4:SETCOLOR LOOP,0,0:NEXT LOOP
DI 750   START=DPEEK(88)
OX 760   FOR LOOP=1 TO 5
FK 770     COLOR LOOP+3
GY 780     PLOT LOOP,LOOP:DRAWTO 79-LOOP,LOOP
SF 790     DRAWTO 79-LOOP,27-LOOP:DRAWTO LOOP,27-LOOP
LL 800     DRAWTO LOOP,LOOP
ZT 810   NEXT LOOP
WN 820   COLOR 4
BS 830   TEXT 17,9,"PAGE 6"
UA 840   MOVE START,MSG,1080
MF 850   GRAPHICS 10
RG 860   FOR LOOP=0 TO 4:SETCOLOR LOOP,0,0:NEXT LOOP
SX 870   FOR LOOP=4 TO 40 STEP 4
QM 880     COLOR C+4
PU 890     CIRCLE 40,96,LOOP,LOOP*192/80
KV 900     FCOLOR C+4:PAINT 41-LOOP,96
OI 910     C=(C+1) MOD 5
ZW 920   NEXT LOOP
XQ 930   COLOR 6
PP 940   MOVE START,WHERE,8130
MG 950   GRAPHICS 10
OO 960   POKE 704,0
NQ 970   FOR LOOP=0 TO 4
RY 980     SETCOLOR 4-LOOP,6,(LOOP+1)*2
AK 990   NEXT LOOP
YC 1000 ENDPROC
XF 1010 ----------------------------------
XI 1020 ----------------------------------
SZ 1030 # MAIN
IC 1040 EXEC INTRO
KM 1050 EXEC SETUP
GD 1060 EXEC SPECIAL
KL 1070 DO
CY 1080   EXEC KEY
MN 1090 LOOP
```

REAL-TIME CLOCK

Len Golding brings you a super machine code utility that lets you use your Atari for any number of counting and timing applications

This machine-code program allows your Atari to keep track of the time. You can use it as an ordinary clock, alarm clock, process timer, interval timer and much more. It is a stand-alone program which needs no help from Basic, but it is designed to interface easily with Basic applications software. The routine can be either cassette or disk based, and it will work on all Atari 8-bit computers and can easily be adapted for NTSC compatibility so readers in Europe and the USA needn't feel left out.

The clock Loads and Runs automatically on power-up, and it's accurate to within 30 seconds per day. It can be started, stopped, set and reset manually from the keyboard, or by simple PEEK and POKE instructions in a Basic program.

The routine creates an extra screen line for the display, so you lose none of your normal programming area. It's immune to Break and Reset, and even changing Graphics modes will not worry it in the slightest. All the action takes place during Stage 1 of the vertical-blank interval, so you can still use Stage 2 (deferred) VBIs in your applications. There are several other features which we'll describe as we go along.

TABLE 1: ADDRESSES USED BY THE CLOCK ROUTINE

1777 1778 1779 1780 1781 1782	Seconds Seconds x 10 Minutes Minutes x 10 Hours Hours x 10	PEEK these addresses to read the current time, or POKE with new values to change the time setting
1783	ZEROFLAG	Normally non-zero; changes to 0 when display reaches 00:00:00
1784	LOCKOUT	Normally zero. POKE with any number from 1 to 255 to disable console-key setting
1785	MODE	Clock mode - see Table 2
1786	USR1	Entry point for USR call to zero the display
1789	USR2	Entry point for USR call to initialise Countdown

TYPE IN THE PROGRAMS

The first job is to type in the appropriate machine-code routine - Program 1 if you're using a disk system, Program 2 if you're a cassette user. Both programs work in substantially the same way. When you RUN them they will create an appropriate autoboot file.

Let's look at the disk version first. Start by saving Program 1, then insert a disk which contains DOS.SYS and DUP.SYS, but no other files. Run Program 1 to create an AUTORUN.SYS file containing the entire clock routine. Now switch off the computer, wait a few seconds and switch back on again. After the usual start-up delay, you'll see the extra line, complete with digital display, appear on screen.

To make the cassette version, type in and Save Program 2, then insert a fully re-wound blank tape, type RUN and hit return. Nothing will appear to happen for about twenty seconds, then you'll hear the familiar double beep. Follow the usual CSAVE procedure, and the clock routine will be written to an autoboot file for you. This file is then loaded like any other machine-code cassette - switch on the computer while holding down the START key and proceed as for CLOAD. The tape takes about twenty seconds to load, then the clock display will appear.

SETTING THE TIME

Initially the clock latches into 'standby' mode, with the count frozen at 00:00:00, so our first job is to set the correct time of day. This process is similar to setting a digital watch, with the console keys serving as function buttons.

Hold down SELECT and the message 'Set Seconds' appears. While still holding SELECT, press OPTION and the seconds dis-

```
WO 1 REM ********************************
VW 2 REM *       REAL TIME CLOCK        *
HD 3 REM *       for ATARI XL/XE        *
SF 4 REM *     (Cassette version)       *
ZU 5 REM *       by Len Golding         *
SS 6 REM * ---------------------------- *
KD 7 REM * PAGE 6 MAGAZINE - ENGLAND    *
WV 8 REM ********************************
NO 9 REM
RV 10 REM PROGRAM 2 - Makes an autoboot c
   assette version of the Clock routine
YS 20 BFR=(PEEK(106)-24)*256:REM reserve
   a safe area at the top of RAM as a tem
   porary buffer
MN 30 FOR X=0 TO 46:READ D:POKE 1536+X,D:
   NEXT X:REM Load the new SAVE routine i
   nto page 6
OC 40 DATA 104,104,133,204,104,133,203,10
   4,133,206,104,133,205,162,16,169,11,15
   7,66,3
PG 50 DATA 165,203,157,68,3,165,204,157,6
   9,3,165,205,157,72,3,165,206,157,73,3
HH 60 DATA 32,86,228,96,67,58,155
NA 70 REM Load the program temporarily in
   to the reserved buffer space
TF 80 X=0:RESTORE 150
LM 90 READ D:IF D=-1 THEN 120
MS 100 POKE BFR+X,D:X=X+1:GOTO 90
NT 110 REM Now read the data from the tem
   porary buffer into an Autoboot cassett
   e file
TV 120 OPEN #1,8,128,"C:"
KA 130 X=USR(1536,BFR,PEEK(BFR+1)*128)
NY 140 END
PX 150 DATA 0,8,237,6,35,7,169,60,141,2,2
   11,208,6,76,253,9,76,42,10,162
YQ 160 DATA 50,169,41,142,96,10,141,87,10
   ,32,254,9,32,29,10,169,0,141,248,6
BO 170 DATA 173,48,2,141,90,10,173,49,2,1
   41,91,10,24,96,169,234,141,231,2,169
JK 180 DATA 10,141,232,2,162,7,160,55,169
   ,6,32,92,228,96,165,66,240,26,173,88
DL 190 DATA 10,16,14,173,249,6,141,89,10,
   9,1,141,249,6,32,185,8,169,10,141
KA 200 DATA 88,10,16,19,173,88,10,48,14,2
   08,9,173,89,10,141,249,6,32,185,8
IH 210 DATA 206,88,10,162,38,173,249,6,20
   1,16,144,5,169,4,141,249,6,41,4,240
RX 220 DATA 11,169,0,157,117,10,32,29,10,
   76,195,7,169,10,157,117,10,206,95,10
XV 230 DATA 16,9,206,102,10,173,87,10,141
   ,95,10,206,102,10,16,38,32,35,10,173
MB 240 DATA 249,6,41,2,240,25,32,176,9,17
   3,247,6,208,6,32,254,9,76,195,7
IA 250 DATA 173,249,6,41,251,141,249,6,76
   ,195,7,32,12,9,173,249,6,41,2,205
GO 260 DATA 98,10,240,18,141,98,10,41,2,2
   40,8,173,247,6,240,3,76,107,8,76
VP 270 DATA 84,8,32,185,8,206,100,10,48,3
   ,76,182,8,169,10,141,100,10,173,248
WL 280 DATA 6,240,3,76,182,8,173,31,208,1
   62,0,201,7,144,6,142,101,10,76,182
LC 290 DATA 8,173,249,6,41,254,141,249,6,
   173,31,208,201,0,208,6,32,254,9,76
SY 300 DATA 68,8,201,1,208,43,173,97,10,2
   40,223,160,4,140,249,6,201,1,208,6
HF 310 DATA 32,12,9,76,68,8,201,2,208,6,3
   2,40,9,76,68,8,201,3,208,194
RV 320 DATA 32,66,9,32,106,9,76,182,8,201
   ,6,208,12,142,97,10,142,249,6,32
HV 320 DATA 169,0,141,171,33,240,5,169,25
   5,141,171,33,173,249,6,41,1,208,37,173
XT 330 DATA 171,33,48,44,142,169,33,140,1
   70,33,138,24,105,3,141,194,33,152,105,
   0
JC 340 DATA 141,195,33,169,188,141,48,2,1
   69,33,141,49,2,76,46,32,173,169,33,141
FE 350 DATA 48,2,173,170,33,141,49,2,96,1
   62,0,238,241,6,173,241,6,201,10,144
FY 360 DATA 82,142,241,6,238,242,6,173,24
   2,6,201,6,144,69,142,242,6,238,243,6
XN 370 DATA 173,243,6,201,10,144,56,142,2
   43,6,238,244,6,173,244,6,201,6,144,43
EL 380 DATA 142,244,6,238,245,6,173,245,6
   ,201,4,144,30,172,246,6,192,2,176,17
RD 390 DATA 201,10,144,19,142,245,6,238,2
   46,6,173,246,6,201,3,144,6,142,245,6
SG 400 DATA 142,246,6,169,0,141,247,6,162
   ,5,189,241,6,9,16,157,182,33,41,15
YC 410 DATA 13,247,6,141,247,6,202,16,237
   ,173,249,6,41,8,208,36,173,182,33,141
OE 420 DATA 219,33,173,183,33,141,218,33,
   173,184,33,141,216,33,173,185,33,141,2
   15,33
IB 430 DATA 173,186,33,141,213,33,173,187
   ,33,141,212,33,96,206,241,6,16,51,169,
   9
JV 440 DATA 141,241,6,206,242,6,16,41,169
   ,5,141,242,6,206,243,6,16,31,169,9
NT 450 DATA 141,243,6,206,244,6,16,21,169
   ,5,141,244,6,206,245,6,16,11,169,9
UL 460 DATA 141,245,6,206,246,6,16,1,96,7
   6,141,32,134,205,132,206,160,11,177,20
   5
VR 470 DATA 153,196,33,136,16,248,140,178
   ,33,96,104,169,0,141,176,33,162,5,157,
   241
WU 480 DATA 6,202,16,250,32,64,33,169,4,1
   41,249,6,32,141,32,162,236,160,33,76
OS 490 DATA 14,33,173,166,33,141,174,33,1
   73,175,33,141,181,33,96,104,169,2,141,
   246
GV 500 DATA 6,169,3,141,245,6,169,5,141,2
   44,6,141,242,6,169,9,141,243,6,141
ZE 510 DATA 241,6,32,141,32,32,64,33,169,
   6,141,249,6,162,249,160,33,76,14,33
AR 520 DATA 173,172,33,133,10,173,173,33,
   133,11,173,68,30,133,12,173,69,30,133,
   13
TS 530 DATA 172,96,228,174,97,228,169,6,3
   2,92,228,169,0,141,231,2,169,30,141,23
   2
VS 540 DATA 2,108,10,0,24,255,0,0,0,0,0,0
   ,0,50,0,0,0,20,0,50
LS 550 DATA 16,16,16,16,16,16,112,112,66,
   196,33,1,0,0,0,0,0,0,0,0
CI 560 DATA 0,0,52,41,45,37,26,0,0,0,16,1
   6,26,16,16,26,16,16,0,0
VT 570 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
   ,0,0,0,0,0
MG 580 DATA 0,0,52,41,45,37,26,0,0,0,35,4
   7,53,46,52,36,47,55,46,0
GZ 590 DATA 51,101,116,0,51,101,99,111,11
   0,100,115,0,51,101,116,0,45,105,110,11
   7
GF 600 DATA 116,101,115,0,0,0,51,101,116,
   0,40,111,117,114,115,224,2,225,2,0,30,
   -1
```

Listing 1 - The Routine for Disk users

```
WO 1 REM ******************************
VW 2 REM *       REAL TIME CLOCK       *
HD 3 REM *       for ATARI XL/XE       *
SF 4 REM *     (Cassette version)      *
ZU 5 REM *       by Len Golding        *
SS 6 REM * -------------------------- *
KD 7 REM * PAGE 6 MAGAZINE - ENGLAND  *
WV 8 REM ******************************
NO 9 REM
RV 10 REM PROGRAM 2 - Makes an autoboot c
   assette version of the Clock routine
YS 20 BFR=(PEEK(106)-24)*256:REM reserve
   a safe area at the top of RAM as a tem
   porary buffer
MN 30 FOR X=0 TO 46:READ D:POKE 1536+X,D:
   NEXT X:REM Load the new SAVE routine i
   nto page 6
OC 40 DATA 104,104,133,204,104,133,203,10
   4,133,206,104,133,205,162,16,169,11,15
   7,66,3
PG 50 DATA 165,203,157,68,3,165,204,157,6
   9,3,165,205,157,72,3,165,206,157,73,3
HH 60 DATA 32,86,228,96,67,58,155
NA 70 REM Load the program temporarily in
   to the reserved buffer space
TF 80 X=0:RESTORE 150
LM 90 READ D:IF D=-1 THEN 120
MS 100 POKE BFR+X,D:X=X+1:GOTO 90
NT 110 REM Now read the data from the tem
   porary buffer into an Autoboot cassett
   e file
TV 120 OPEN #1,8,128,"C:"
KA 130 X=USR(1536,BFR,PEEK(BFR+1)*128)
NY 140 END
PX 150 DATA 0,8,237,6,35,7,169,60,141,2,2
   11,208,6,76,253,9,76,42,10,162
YQ 160 DATA 50,169,41,142,96,10,141,87,10
   ,32,254,9,32,29,10/169,0,141,248,6
BO 170 DATA 173,48,2,141,90,10,173,49,2,1
   41,91,10,24,96,169,234,141,231,2,169
JK 180 DATA 10,141,232,2,162,7,160,55,169
   ,6,32,92,228,96,165,66,240,26,173,88
DL 190 DATA 10,16,14,173,249,6,141,89,10,
   9,1,141,249,6,32,185,8,169,10,141
KA 200 DATA 88,10,16,19,173,88,10,48,14,2
   08,9,173,89,10,141,249,6,32,185,8
IH 210 DATA 206,88,10,162,38,173,249,6,20
   1,16,144,5,169,4,141,249,6,41,4,240
RX 220 DATA 11,169,0,157,117,10,32,29,10,
   76,195,7,169,10,157,117,10,206,95,10
XV 230 DATA 16,9,206,102,10,173,87,10,141
   ,95,10,206,102,10,16,38,32,35,10,173
MB 240 DATA 249,6,41,2,240,25,32,176,9,17
   3,247,6,208,6,32,254,9,76,195,7
IA 250 DATA 173,249,6,41,251,141,249,6,76
   ,195,7,32,12,9,173,249,6,41,2,205
GO 260 DATA 98,10,240,18,141,98,10,41,2,2
   40,8,173,247,6,240,3,76,107,8,76
VP 270 DATA 84,8,32,185,8,206,100,10,48,3
   ,76,182,8,169,10,141,100,10,173,248
WL 280 DATA 6,240,3,76,182,8,173,31,208,1
   62,0,201,7,144,6,142,101,10,76,182
LC 290 DATA 8,173,249,6,41,254,141,249,6,
   173,31,208,201,0,208,6,32,254,9,76
SY 300 DATA 68,8,201,1,208,43,173,97,10,2
   40,223,160,4,140,249,6,201,1,208,6
HF 310 DATA 32,12,9,76,68,8,201,2,208,6,3
   2,40,9,76,68,8,201,3,208,194
RV 320 DATA 32,66,9,32,106,9,76,182,8,201
   ,6,208,12,142,97,10,142,249,6,32
AQ 330 DATA 22,10,76,182,8,201,2,208,19,1
   73,247,6,240,160,169,2,141,249,6,142
LQ 340 DATA 97,10,32,80,10,76,182,8,201,5
   ,208,65,172,101,10,208,60,200,140,101
QN 350 DATA 10,173,249,6,9,4,141,249,6,23
   8,97,10,173,97,10,201,4,144,5,169
SF 360 DATA 1,141,97,10,201,1,208,7,162,1
   82,160,10,76,179,8,201,2,208,7,162
WL 370 DATA 194,160,10,76,179,8,201,3,208
   ,7,162,206,160,10,32,235,9,76,95,228
FU 380 DATA 174,48,2,172,49,2,224,109,208
   ,4,192,10,240,7,169,0,141,92,10,240
WH 390 DATA 5,169,255,141,92,10,173,249,6
   ,41,1,208,37,173,92,10,48,44,142,90
QZ 400 DATA 10,140,91,10,138,24,105,3,141
   ,115,10,152,105,0,141,116,10,169,109,1
   41
SJ 410 DATA 48,2,169,10,141,49,2,76,11,9,
   173,90,10,141,48,2,173,91,10,141
DW 420 DATA 49,2,96,162,0,238,241,6,173,2
   41,6,201,10,144,82,142,241,6,238,242
AJ 430 DATA 6,173,242,6,201,6,144,69,142,
   242,6,238,243,6,173,243,6,201,10,144
GV 440 DATA 56,142,243,6,238,244,6,173,24
   4,6,201,6,144,43,142,244,6,238,245,6
FP 450 DATA 173,245,6,201,4,144,30,172,24
   6,6,192,2,176,17,201,10,144,19,142,245
WG 460 DATA 6,238,246,6,173,246,6,201,3,1
   44,6,142,245,6,142,246,6,169,0,141
PA 470 DATA 247,6,162,5,189,241,6,9,16,15
   7,103,10,41,15,13,247,6,141,247,6
LP 480 DATA 202,16,237,173,249,6,41,8,208
   ,36,173,103,10,141,140,10,173,104,10,1
   41
BA 490 DATA 139,10,173,105,10,141,137,10,
   173,106,10,141,136,10,173,107,10,141,1
   34,10
VO 500 DATA 173,108,10,141,133,10,96,206,
   241,6,16,51,169,9,141,241,6,206,242,6
FI 510 DATA 16,41,169,5,141,242,6,206,243
   ,6,16,31,169,9,141,243,6,206,244,6
QA 520 DATA 16,21,169,5,141,244,6,206,245
   ,6,16,11,169,9,141,245,6,206,246,6
XZ 530 DATA 16,1,96,76,106,9,134,205,132,
   206,160,11,177,205,153,117,10,136,16,2
   48
II 540 DATA 140,99,10,96,104,169,0,141,97
   ,10,162,5,157,241,6,202,16,250,32,29
GR 550 DATA 10,169,4,141,249,6,32,106,9,1
   62,157,160,10,76,235,9,173,87,10,141
TE 560 DATA 95,10,173,96,10,141,102,10,96
   ,104,169,2,141,246,6,169,3,141,245,6
NQ 570 DATA 169,5,141,244,6,141,242,6,169
   ,9,141,243,6,141,241,6,32,106,9,32
PN 580 DATA 29,10,169,6,141,249,6,162,170
   ,160,10,76,235,9,24,255,0,0,0,0
BB 590 DATA 0,0,0,50,0,0,0,20,0,50,16,16,
   16,16,16,16,112,112,66,117
YY 600 DATA 10,1,0,0,0,0,0,0,0,0,0,52,4
   1,45,37,26,0,0,0
TF 610 DATA 16,16,26,16,16,26,16,16,0,0,0
   ,0,0,0,0,0,0,0,0,0
DY 620 DATA 0,0,0,0,0,0,0,0,0,0,0,52,41
   ,45,37,26,0,0,0
LP 630 DATA 35,47,53,46,52,36,47,55,46,0,
   51,101,116,0,51,101,99,111,110,100
KP 640 DATA 115,0,51,101,116,0,45,105,110
   ,117,116,101,115,0,0,0,51,101,116,0
UE 650 DATA 40,111,117,114,115,-1
```

Listing 2 - The Routine for Cassette users

play will advance rapidly. When the correct setting is reached, release both keys. Repeat the procedure to step through 'Set Minutes' and 'Set Hours'. If you wish to step through the phases without altering the time, simply press and release SELECT. When the setting is correct, or at any time during the setting process, the clock can be started.

Press START to set it counting upwards at one-second intervals from your pre-set time. You can also make it count downwards, provided you're not already at zero, by holding down OPTION and pressing START. While the clock is counting in either direction, an asterisk appears to the right of the display. This disappears when the clock stops counting for any reason.

YOUR ATARI AS A STOPWATCH

If you want to use the clock as a stopwatch, use START to set it going and SELECT to stop it (ignoring the 'Set Seconds' message). To resume counting, press START again. To zero the display, hold down OPTION, then press SELECT and START together. The count will now freeze at 00:00:00 until you press START again.

The clock contains several features which are not accessible via the console keys, but can easily be controlled by Basic PEEKs and POKEs from inside your own applications software. Table 1 shows the relevant addresses, which are identical for both cassette and disk versions.

The display registers (1777 to 1782) contain the current time, in ordinary decimal form - one register for each digit. To set the clock from inside a Basic program, simply POKE new values into these registers. The new setting will appear when the clock next changes. If the display is locked (hang on, we're getting to that) then the new setting won't appear until you unlock it.

It is possible to POKE higher numbers than are usually acceptable in a clock display - for example '9' into the 'Hours x 10' address. This may be useful for special purposes, but it's usually best to insert some form of trapping system in your applications software to stop the user doing this. An example can be seen in the alarm clock routine at Program 3, lines 80 to 110.

COUNTDOWN MODE

In Countdown mode you will usually want to know instantly when zero has been reached. Address 1783 (ZEROFLAG) makes this easy. If the display is non-zero, this address will contain a number between 1 and 15, but as soon as the display reaches six zeros, the value in ZEROFLAG drops to 0.

Address 1784 (LOCKOUT) is used to protect your applications software from accidental alteration (or deliberate tampering!) while it's running. If you POKE any value from 1 to 255 into this address, then pressing the console keys will have no effect on the clock. You can then use the console keys as usual in your own Basic programs.

FIFTEEN DIFFERENT MODES!

Now we need to explore the various clock modes - there are fifteen of them! Table 2 shows what's available. Every mode has its own unique number, which you can POKE into address 1785.

If you select a 'Display off' mode, then the extra display line will disappear from the screen. This happens automatically during any time-critical I/O transactions, such as Loading or Saving. And while we're on the subject, cassette users will notice that the 'beep' routine resets the clock! This is because it interferes with

TABLE 2: CLOCK MODES

MODE	CLOCK DISPLAY	COUNT UP/DOWN	COUNT START/STOP	DIGITS
0	ON	UP	COUNTING	CHANGING
1	OFF	UP	COUNTING	CHANGING
2	ON	DOWN	COUNTING	CHANGING
3	OFF	DOWN	COUNTING	CHANGING
4	ON	UP	STOPPED	CHANGING
5	OFF	UP	STOPPED	CHANGING
6	ON	DOWN	STOPPED	CHANGING
7	OFF	DOWN	STOPPED	CHANGING
8	ON	UP	COUNTING	LOCKED
9	OFF	UP	COUNTING	LOCKED
10	ON	DOWN	COUNTING	LOCKED
11	OFF	DOWN	COUNTING	LOCKED
12	ON	UP	STOPPED	LOCKED
13	OFF	UP	STOPPED	LOCKED
14	ON	DOWN	STOPPED	LOCKED
15	OFF	DOWN	STOPPED	LOCKED
>15	REVERTS TO MODE 4			
4 is the normal Standby mode 6 is the Countdown Standby mode				

the CONSOL register, and you can overcome the problem by POKEing a non-zero number into LOCKOUT before requesting any cassette I/O.

In 'Count up' mode, the display will wrap around from 23:59:59 to 00:00:00 and continue counting, but in 'Countdown' mode the clock freezes at zero.

JUST A COUNTER?

In 'Counting' mode, the clock counts up or down as directed, though you can freeze the display or even remove it from the screen. In 'Stopped' mode, the counting is halted.

The display can be frozen at any time by selecting a 'Locked' mode, though counting can continue in the background - rather like a stopwatch 'lap' function (see Mode 8). The asterisk at top-right of the screen is useful here, its presence indicates that counting is continuing, even though the display may be temporarily frozen.

Table 2 is a bit daunting until you get used to it. The easiest way to find the mode you require is to work from right to left, halving the number of choices at each step. The modes you'll use most will probably be 0, 4, 2 and 6.

Returning to Table 1, there are two addresses we haven't mentioned: 1786 and 1789. These provide stable entry points for two machine-code subroutines which you can use in your application programs. The command X=USR(1786) will zero the display and latch into the 'count-up standby' mode 4. A similar call to address 1789 will set the display to 23:59:59 and select 'count down standby' mode 6.

The clock as shown is designed to operate with the British PAL TV standard, but it can be easily adapted to suit the NTSC system. Look at line 70 in Program 1, or line 160 in Program 2. To modify the routine, change the first number from 50 to 60, and the third number from 41 to 52. Save the new version then Run it to make an NTSC-compatible autoboot file. The second of these numbers - 41 or 52 - is the clock speed's fine-tuning

```
WO 1 REM ******************************
SS 2 REM *         ALARM CLOCK        *
HD 3 REM *       for ATARI XL/XE      *
MH 4 REM * (use with REAL TIME CLOCK) *
ZU 5 REM *       by Len Golding       *
SS 6 REM * -------------------------- *
KD 7 REM * PAGE 6 MAGAZINE - ENGLAND  *
WV 8 REM ******************************
NO 9 REM
BF 10 REM PROGRAM 3: Alarm Clock - Beeps
   when pre-set time is reached.
HR 20 DHH=1782:DHL=1781:DMH=1780:DML=1779
   :DSH=1778:DSL=1777:REM Clock display r
   egisters
SS 30 MODE=1785:LOCKOUT=1784:ZEROFLAG=178
   3:ZERO=1786:CDOWN=1789:REM Control reg
   isters and USR addresses
DI 40 X=USR(ZERO):POKE LOCKOUT,1:REM Zero
    display and go to Standby Mode (4)
RV 50 POKE LOCKOUT,1:REM Disable the cons
   ole key setting facility
TX 60 REM Set the curent time:
JB 70 ? "}":? "WHAT IS THE CORRECT TIME N
   OW?":?
SD 80 TRAP 70
AH 90 ? "  HOURS:";" ";:INPUT H:IF H<0 OR
    H>23 THEN 90
YB 100 ? "MINUTES:";" ";:INPUT M:IF M<0 O
   R M>59 THEN 100
OO 110 ? "SECONDS:";" ";:INPUT S:IF S<0 O
   R S>59 THEN 110
GA 120 REM Convert the values into indivi
   dual digits:
LX 130 HH=INT(H/10)
VU 140 HL=H-HH*10
PI 150 MH=INT(M/10)
AJ 160 ML=M-MH*10
TK 170 SH=INT(S/10)
FV 180 SL=S-SH*10
YN 190 ? HH;HL;":";MH;ML;":";SH;SL
IK 200 REM Insert the digits into the six
    display registers:
BI 210 POKE DHH,HH:POKE DHL,HL:POKE DMH,M
   H:POKE DML,ML:POKE DSH,SH:POKE DSL,SL
TU 220 POKE MODE,0:REM Start the clock
FL 230 REM Set the alarm time:
WE 240 ? "}":? "WHEN DO YOU WANT THE ALAR
   M TO GO OFF?"
MD 250 TRAP 240
LO 260 ? "HOURS:";" ";:INPUT H:IF H<0 OR
   H>23 THEN 260
OP 270 ? "MINUTES:";" ";:INPUT M:IF M<0 O
   R M>59 THEN 270
FC 280 ? "SECONDS:";" ";:INPUT S:IF S<0 O
   R S>59 THEN 280
GP 290 REM Convert the values into indivi
   dual digits:
LT 300 HH=INT(H/10)
VQ 310 HL=H-HH*10
PE 320 MH=INT(M/10)
AF 330 ML=M-MH*10
TG 340 SH=INT(S/10)
FR 350 SL=S-SH*10
GC 360 ? "}":? "ALARM WILL GO OFF AT ";HH
   ;HL;":";MH;ML;":";SH;SL
JM 370 REM Loop until the pre-set time is
    reached:
PG 380 IF PEEK(DHH)=HH AND PEEK(DHL)=HL A
   ND PEEK(DMH)=MH AND PEEK(DML)=ML AND P
   EEK(DSH)=SH AND PEEK(DSL)=SL THEN 410
QE 390 GOTO 380
MZ 400 REM Pre-set time has arrived:
EM 410 SOUND 0,120,10,8
JI 420 FOR W=1 TO 500:NEXT W
VU 430 SOUND 0,0,0,0
OB 440 END
```

Listing 3 - An alarm clock

```
WO 1 REM ******************************
UF 2 REM *      COUNTDOWN TIMER       *
HD 3 REM *       for ATARI XL/XE      *
ZZ 4 REM * (Use with REAL TIME CLOCK) *
ZU 5 REM *       by Len Golding       *
SS 6 REM * -------------------------- *
KD 7 REM * PAGE 6 MAGAZINE - ENGLAND  *
WV 8 REM ******************************
NO 9 REM
OY 10 REM PROGRAM 4: Countdown timer - So
   unds an alarm when count reaches 00:00
   :00
HR 20 DHH=1782:DHL=1781:DMH=1780:DML=1779
   :DSH=1778:DSL=1777:REM Clock display r
   egisters
SS 30 MODE=1785:LOCKOUT=1784:ZEROFLAG=178
   3:ZERO=1786:CDOWN=1789:REM Control reg
   isters and USR addresses
XJ 40 X=USR(CDOWN):REM Initialise display
    to 23:59:59 and go into Countdown Sta
   ndby mode (6)
RV 50 POKE LOCKOUT,1:REM Disable the cons
   ole key setting facility
MU 60 ? "}":? "WHAT IS THE COUNTDOWN STAR
   T TIME?":?
RT 70 TRAP 60
YI 80 ? "  HOURS:";" ";:INPUT H:IF H<0 OR
    H>23 THEN 80
FE 90 ? "MINUTES:";" ";:INPUT M:IF M<0 OR
    M>59 THEN 90
MM 100 ? "SECONDS:";" ";:INPUT S:IF S<0 O
   R S>59 THEN 100
LT 110 HH=INT(H/10)
VQ 120 HL=H-HH*10
PE 130 MH=INT(M/10)
AF 140 ML=M-MH*10
TG 150 SH=INT(S/10)
FR 160 SL=S-SH*10
RB 170 ? "}":? "Countdown started at  ";H
   H;HL;":";MH;ML;":";SH;SL
BV 180 POKE DHH,HH:POKE DHL,HL:POKE DMH,M
   H:POKE DML,ML:POKE DSH,SH:POKE DSL,SL
UM 190 POKE MODE,2:REM Start the clock in
    Countdown Mode.
JD 200 IF PEEK(ZEROFLAG)<>0 THEN 200
JH 210 REM Count has reached 00:00:00
DX 220 SOUND 0,200,10,8
JI 230 FOR W=1 TO 500:NEXT W
VU 240 SOUND 0,0,0,0
OB 250 END
```

Listing 4 - A countdown timer

REAL TIME CLOCK

control. The lower the number, the faster the clock, so you can experiment if you wish.

SOME REAL APPLICATIONS

Finally, let's look at some applications software - Programs 3 and 4. The machine-code routine must be in memory before you Run either of these, or the USR calls will crash. Both programs are fairly rudimentary, so you'll probably want to add your own bells and whistles. It would be easy, for example, to send or receive signals through the various ports (joystick, serial or printer) at pre-determined times of day, or at pre-set intervals.

You may well find additonal uses for these routines and could soon be using your Atari in applications you never dreamt of.

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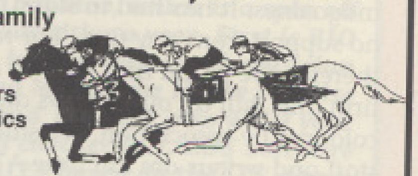
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See PAGE 6 Magazine Issue 37 page 29 for further details of this super program. Tape version has all the facilities and fun of the disk version except that the number of horse databases is limited. *AVAILABLE EXCLUSIVELY FROM PAGE 6*

Mark Hutchinson's

RANDOM NOTES

This issue I had hoped to write about the ST and why some people love it and others loathe it. However, as I received no mail whatsoever on this subject it can be put in the 'Black Hole' along with female ATARI users (or rather letters from female users!), with due apologies to Linda who did respond (yes, I will use your SAE soon!).

So, what now. Well, I have been in contact with Paul Rixon who used to write reviews for our local, and now dead, user magazine and no does a sterling job for Page 6. He was complaining wholeheartedly about the serious lack of new 8-bit software. More of that anon.

A few days ago I received a letter from Mike Parfitt to tell me that the comments made in this column about the so called 'ATARI Games Centres' was quite true - they are a big con. The shop he tried did not even know a 1020 was an ATARI item. He did give me some good news and recommended a pat on the back for Logic Sales of Southgate who told him that they simply could not satisfy the demand from ATARI owners.

Will ATARI ever own up to the fact that they are just a computer manufacturer and allow a third party consortium of dealers and user groups to set up a nationwide, single 'official' ATARI user group? Would ATARI (UK) Corp help this group with hard cash sponsorship? It seems to me that there are some large groups already halfway there. Each could serve their own area but help other, less privileged areas and could all get together for three days of lectures, reviews, proper hardware and software demonstrations (by the dealers) etc. at a suitable location without the empty promises that we get every year from other places. How about it?

Naturally some dealers would see this as the golden opportunity for free advertisement and a closed, sellers' market. Not so! The ATARI owner has had his and her eye wiped too often by the phrase 'We do not have it in stock at the moment', or 'Ring our office and we will post it out' for these firms to make a killing at such a venture. We are not naive enough to believe that firms are really altruistic, we know they need to make money to survive, but we do know those firms who are on our side and we can trust.

As for the software problem? Well, the idea of a users complaint form at the next show had only a few responses, all in favour. Mike also mentioned that, although he would not be at the show, he would like to add his name to the form and could PAGE 6 start the ball rolling?

I believe that PAGE 6 is a bastion in the world of computer magazines. It has had to stand on its own against all odds with no support from any firm, bar regular advertising. We can therefore be proud that we owe no allegiance to any product or firm and that all our reviews and comments are true and not coloured by association. We stand by the user because all our staff and writers are full time ATARI users themselves. However, I feel that this subject could be better handled if it came from a Users Committee leaving the magazine unbiased and free to report comments from both sides. This is only my personal opinion and has nothing to do with the Editor or PAGE 6 policy. This may seem to be sidestepping the issue but I feel that there are two sides to the argument and we, as a magazine, should be allowed to air both opinions freely.

Back to Paul Rixon. I did suggest that he could look at some old, but still available software. This would be hard for him as certain firms advertise a large stock that seems to vanish when an order is placed. The reason I made this suggestion (and regular readers will note that I usually state this) is that I feel there is enough good software from several years ago to keep new owners happy. What software does he mean, you may well ask. Well, how about some from 1983 for a start?

DISKEY by Sparky Starks (Adventure International - AI), **FILEMANAGER 800** (Synapse), **QS-FORTH** (Quality Software), **TINY-C** (Systems Software Inc), **INTER-LISP** (Datasoft), **Tricky Tutorials** (Santa Cruz), **any of the Scott Adams adventures** (AI), any of the Pacman clones such as **JAW-BREAKER** (On-Line Systems), **RASTER BLASTER** (Budgeco), **THRESHOLD** (On-Line Systems)

That is a good selection to start with and you'll find more in Kirk Ruebottom's article about the 'never available' software elsewhere in this issue.

All the programs I have mentioned were available in the UK. There are hundreds more, some good some bad, that never made it across the Atlantic. I still think that if a UK dealer were to try to get American software that has run out of copyright then they could make a small fortune over here. Still, that is only my humble opinion!

For some reason disks have always been more expensive than cassettes. I know some disk based programs have had extra graphics and such, but I also know from small scale production myself that disks are easier, cheaper and quicker to produce than tape, they are also more reliable in large production rates. So, Robert O'Hare from Middlewich, will PAGE 6 ever produce tapes? This is the Editors decision and would really depend on demand. Could the magazine support the cost of a high speed tape copier? If enough people wrote in and asked for tape than we would oblige, but then how many of you fill in the once a year questionnaire? By the way Robert, the 800XL is an 8-bit machine.

One last point, I get a lot of mail which I can only answer directly if you supply me with an SAE. For those who only send a letter that has questions to be answered then you will have to wait for the response to appear here. For instance, if Malcolm Taylor from BFPO 112 reads this and sends me a disk with about 30p of british stamps then I could include some small demo programs that would help him out. I do not have the time to actually write a full blown program for anyone but I can write some small demos to help out. No questions about synths please, as I am tone deaf! Anything I know nothing about is passed on to the relevant person.

That is it for another issue. I cannot tell you what rambling will appear next issue but I hope you will be there to read it.

Don't forget you can always write to me, (and you should!) so that we can get a few more things aired in this column. Drop me a line.

Write to: Mark Hutchinson, 1, Hollymount, Erinvale, Finaghy, Belfast BT10 0GL

The ST FILE

EDUCATIONAL software comes of age

Fun starts on page 54



BIO CHALLENGE - Palace software's shoot 'em up avec la difference



RISK - Mastertronic are bringing the famous board game to the ST



BATTLE CHESS - Now, with Electronic Arts redefining the rules, chess is no longer the sedate thinking man's game



ULTIMA V - There were rumours that it wouldn't be out on the ST



BARGAIN SOFTWARE - Electronic Arts new budget releases for under a tenner

ST NEWS

Microprose have been rather busy lately what with buying up Telecomsoft and launching new labels but they have found time to release a few ST titles foremost among which is ULTIMA V, the eagerly awaited sequel twice the size of it's predecessor and with the ability to transfer characters from Ultima IV, and AIRBOURNE RANGER, an action simulation which arrived a couple of days ago and looks to be very good, review next issue. Microprose are also into the sports field with MICROPROSE SOCCER. Electronic Arts BATTLE CHESS has some stunning graphics and combines the traditional chess board with fantasy battle sequences as each piece tries to take another. Domark continue their tie-ins with famous films by releasing LICENCE TO KILL and they sent us some slides of the most stunning graphics ever seen on any computer (they're stills from the film, you fool!). Palace Software have signed up a French Company, Delphine, which is a spin off of French record company owned by a 'playboy millionaire' that expects to release 3 or 4 arcade titles a year. First is BIO CHALLENGE with all programming done in-house and nine new pieces of music composed by a professional musician purloined from the record company. Shinobi means stealth (or a plate of shark's fins, please) and Melbourne House promise you lots of fun with SHINOBI - MASTER NINJA in which you not only have vicious hands and feet but also whirl your shurikens and nunchakus about as you practice the noble art of Ninjutsu (that's done the spell checker in!). CDS Software are another company strong in the licensing game and will be releasing SPORTING TRIANGLES based on the ITV game, you know what it's about don't you, we don't have time to watch the TV! Electronic Arts also have POPULOUS with music by Rob Hubbard, which you will no doubt have seen extensively reviewed elsewhere by now, but then we don't get all those pre-release copies so you won't get our review for a while yet. Finally a cleverly worded press release from Atari quoted a report that "Atari remained the dominant vendor of non-compatible PCs in 1988" and goes on to state that shipments of all personal computers in 1988 were 777,990 compared to 552,350 in 1987. Atari's market share improved from 5.6% to 9.6%. Sounds impressive but a quick bit of calculator bashing shows that Atari sold around 74,680 micros in 1988 and 30,900 in 1987 but that is across all ranges so you can judge for yourself how accurate figures quoted elsewhere of 'around 170,000' ST's in the UK are.

MINIX-ST

written by Andrew Tanenbaum

Matthew Jones likes to dabble around with different languages and finds himself a UNIX compatible language ideal for those who want to investigate different Operating Systems or find a new way of using their ST

I think that the best way to start a review of MINIX is to quote two items from the manual. The first paragraph of the 'Booting and Installing MINIX-ST' chapter reads: *"In this chapter we will describe how to boot and install MINIX-ST. It is assumed that the reader is already familiar with MINIX in general, and has at least some knowledge of UNIX. Readers not at all familiar with UNIX should probably begin by looking at one of the many introductory articles and books about it, as this manual does not contain any tutorial material on UNIX."* . The front cover shows a gentleman with thought bubbles saying "processes", "input/output", "memory management", "file systems" and "while (n--) { *p++ = *q++; }". We're talking technical!

MINIX is neither a Beano comic character, nor an application program. It is a complete multi-tasking operating system for the Atari ST and Mega-ST computers, designed as an educational tool, rather than an end in itself. MINIX started life when AT&T (the originators of UNIX) decided that universities would no longer be able to teach students using the UNIX source code. Since this meant that lecturer Andrew Tanenbaum did not have an operating system to use as'an example, he decided to write his own - the result is MINIX - a completely re-written operating system that is compatible with UNIX V7 (not the most up-to-date in fact). The MINIX software is not really a complete package - to get the best from the software, you need the book by Andrew Tanenbaum called 'Operating Systems, Design and Implementation' which is a complete tutorial on operating system design, describing all the possible problems and their solutions (if any). If you are interested in knowing more about computers and how they work, it is a good read. In addition to discussion of the parts of an operating system, the book describes the actual implementation of the ideas in the form of an operating system - MINIX. A complete listing of the source for the original IBM PC version is included, as is a basic set of instructions for using it. This part of the book (Appendix C) is referred to in the small (62 page) manual supplied with the disks, and the book is an essential component. Since it is so much cheaper, you may like to buy it first to give you a taster.

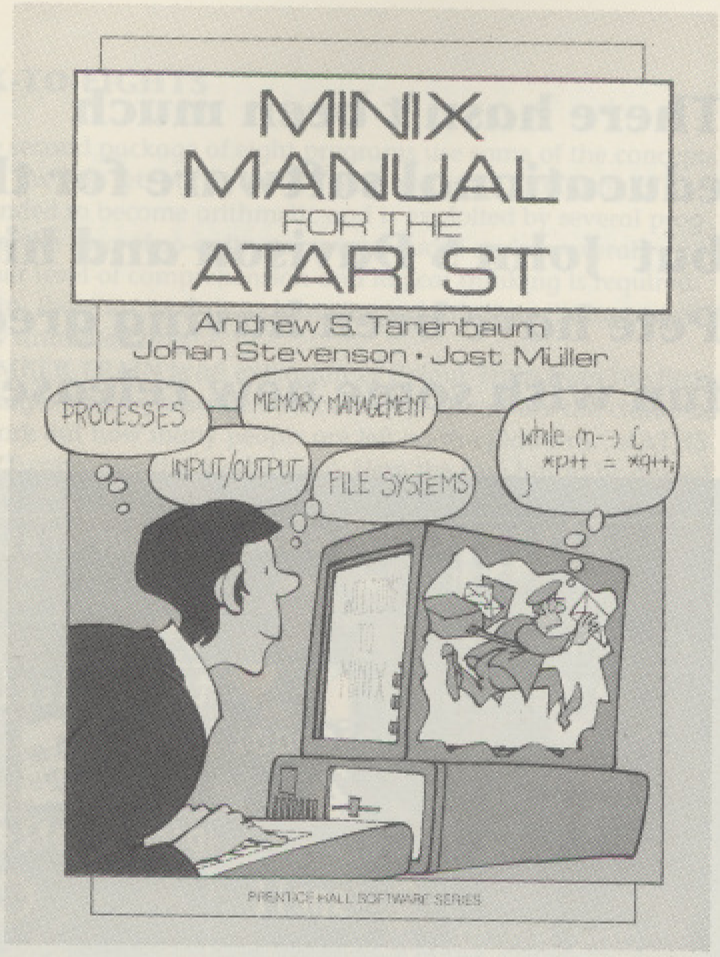
INSTALLATION

MINIX-ST comes on eight single-sided disks. Three of them are used in the boot process and consist of the 00.BOOT disk, the 01.ROOT disk and the 02.USR disk. The MINIX system, like UNIX, has a hierarchical file system (like the TOS folders), but can only have one 'root' directory. Other disk drives are 'mounted' onto a sub-directory to allow access. The root device is always a RAM disk (which can be changed in size), and the 02.USR disk is mounted in the /USR directory during the start-up. This makes half of the MINIX commands (all UNIX compatible) available. To access the others, you must mount disk 04.USER too. On a single drive system, this is obviously not terribly convenient. Another problem is that the compiler is on another two disks (04.ACK1 and 05.ACK2). If you have only a single disk drive, then you will have great problems. Obviously twin double sided disks are better, and a hard disk better still.

The manual covers setting up the system for all possible Atari combinations, including those short of memory (only 512K). Since I only have 512K, I have discovered the delights of trying to get the compiler to compile even simple programs - you cannot just run it - using a procedure covered in the manual. To save typing the commands continuously, I wrote a (Bourne) shell script file, but even that had to be compact since the method leaves only 2K spare. (More and more applications need 1Mb of RAM to work well - the latest Superbase, the Turtle backup, etc. If anyone has a memory upgrade to be reviewed - I'm the person!) It is just possible to compile on a 512K machine, and disks 06.SRC1 and 07.SRC2 contain the full source to the operating system and tools (all except the compiler) for you to examine and change as you wish.

The final disk, 08.TOS is a TOS format disk that contains useful utilities for managing MINIX systems from TOS. The most useful is a program to boot MINIX from within TOS. This program reads a data file into memory and then executes it. Another program is provided to create the data file from the MINIX 00.BOOT disk, but I was unable to create a workable copy from my backup - only from the master. Since you have to modify the boot disk to match your keyboard, this option needs looking at. The source to the program is provided so you could fix it yourself if it does not work for you. With this utility working, it would be possible to boot entirely using a hard disk - MINIX can read the root file system from partition three. An interesting fact I discovered trying to implement this is that the Atari HDX partitioning

MINIX is published by Prentice-Hall, and is available from bookshops, quote ISBN 13-584392-8, price £99.44 inc VAT. The manual (13-584434-7) is also available separately for £10.70. The book 'Operating Systems: Design and Implementation' is ISBN 13-637331-3 and around £20.
More information can be obtained from Prentice Hall, 66 Wood Lane End, Hemel Hempstead, Hertfordshire HP2 4RG. Telephone 0442 231555.



program cannot be used to just adjust the size of one or two partitions - it must destroy them all. The IBM PC equivalent allows you to alter one without disturbing the others. The effect of this is that I had to dedicate a whole 5Mb partition to a 115K root file system, or lose everything on the hard disk. I would have gone for the former, but finally decided to boot from floppy.

USING MINIX

When MINIX is up and running, you are first asked for the date in the usual UNIX manner ('enter date and time in form MMDDYYHHMMSS'), and then given the 'login:' prompt. Mega-ST owners can use a utility to access the real-time clock to save the date step. Any UNIX compatible system has two levels of user, the ordinary user and the super user. The super user can do absolutely anything on the system, such as looking at any file he likes, changing anyone's password, accessing special files - anything possible without restriction. The super user level is normally used for the system administrator, to add new users to the system, tidy up, and sort out problems when they arise. In normal use, you would use the identity of a standard user, so that the operating system will stop you doing dangerous things and interfering with other peoples files (unless they want you to).

MINIX could be used as a complete multi-user system if you wrote a driver for the serial port, but as it stands it multi-tasks effectively. You could (on a machine with 1Mb of RAM or more), set a directory copy, a compile and a document format/print process all going in the background, while editing using the supplied MINED editor in the foreground. MINED is not compatible with the UNIX vi editor, since it would be too big. It is adequate for its purpose though, and the source is there if you want to change it!

MINIX is a very good UNIX emulation - it has all the standard UNIX problems that I remember from when I was given charge of a 'real' UNIX system. To get real use from it, you will - as the quoted paragraph said - need another book which covers UNIX V7. I can recommend 'UNIX - The Book' by M Banahan & A Rutter, Sigma Technical Press (ISBN 0-905104-21-8). Our copy is quite old, so whichever book you get, make sure it is about the 1978 version 7, not the later System V (I can't explain the ordering!).

MINIX FOR EDUCATION

If you are interested in learning more about how computer systems work, then the book is a good starting point. MINIX is the practical part, and could indeed be useful for learning by experimentation if you have more than the basic memory (I would suggest a hard disk is required too so that all the commands, compiler and source are there without disk swapping). Each of the UNIX commands are available for experimentation too, and may be easier than experimenting with the workings of the operating system itself. And if you do not wish to modify it, it will give you very good practice on the UNIX operating system - which does seem to be increasing in acceptance. It could indeed be used for real applications, but again with the RAM prerequisite. MINIX never crashed on me, and seems fairly reliable, but since the ST provides no hardware assistance for some basic checks (like stack overflow), it could sometimes give problems. The manual describes how to give a program more stack space, but you need to have enough memory to support it.

DOCUMENTATION

I have already mentioned that the 'manual' supplied is short, and that you will require the Operating Systems book and probably a UNIX book too. The supplied manual really does assume that you have a technical understanding - it is not an idiots' guide. You will have to read it several times to become really familiar, and I spent my time flipping through it trying to find the relevant section that described how to do each task. Once you have MINIX set up and ready to go, you should find you need it less. Chapters cover 'Booting and Installing' (14 pages), 'MINIX-ST Users Guide' (19 pages to cover super-users, keyboard codes, MINED, all the ways to use the C compiler, new MINIX commands, and ST libraries), 'Recompiling MINIX-ST' (5 pages), 'Changes to the Implementation' (16 pages), and 'Troubleshooting' (4 pages). It is brief, but contains all the information you need - any more that you want is probably in the book. Neither the manual nor the book give any detail of the C library calls - again you have to look elsewhere for this sort of detail.

Finally, the manual describes how to get more information about what is happening to MINIX, by accessing the USENET conferencing systems (available on many UNIX systems). This network is mainly available to students and professionals - so should not be too much of a problem for students in higher education. They suggest a readership of 10,000 people - an impressive number of MINIX users!

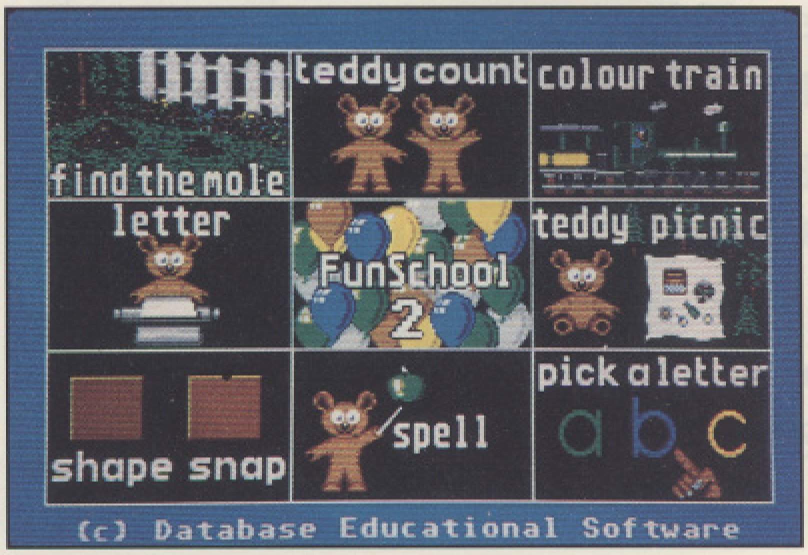
CONCLUSION

MINIX is not for those who consider their computer a tool. It is for the hacker who wants to get 'inside' the computer and tinker with it. As such, it is very good, but you will not get a great deal of use out of it unless you have more than 512K. Twin 720K disks, or a hard disk makes things much more usable. Considering UNIX occupies a 40Mb disk minimum, running MINIX on a single sided 512K system is incredible, but not practical. On a larger system MINIX-ST is good. If you are a hacker or student of computer science (preferably both) MINIX is for you, but otherwise you may find little use for it. •

UNIX is a registered trade mark.

FUN SCHOOL 2

There hasn't been much educational software for the ST but John S Davison and his son Pete have been having great fun with some new releases



Educational software in the best selling software charts? Unbelievable, but true. At the time of writing, this series of educational packages has been as high as number 4 in the Gallup software charts, right up there with the blast 'em ups! Who said educational software never sells!

There are three packages in the Fun School 2 series, categorised by age group to cater for the under-6s, 6-8 year olds, and over-8s. Each is attractively packaged in a colourful cardboard box containing two program disks, nicely produced instructions and parents/teachers' notes printed on glossy card, and a metal pin-on badge for the child to wear.

There's a strong family resemblance between all three packages. Each consists of eight separate programs selected from a graphical menu, and all have a similar style about them. The graphics and animation particularly are of a very high standard throughout. These programs are not just maths and spelling drills, but provide a whole range of exercises designed to make your child think and learn in many different ways.

Most of the programs allow you to set the initial skill level, and will then automatically adjust themselves to the child's ability. Exercises using words allow you to add your own word lists once the child tires of those supplied. For those feeling brave it's possible to modify the programs using STOS. Everything was written in STOS Basic, so if you own STOS you can change the code, sprites, graphics or music for your own purposes.

Program control and entry of answers is via the keyboard or joystick and should be easy enough for virtually any child to cope with. Correct answers are usually rewarded with the obligatory nursery rhyme music, but here it's handled extremely well, using multiple voices playing in pleasant harmony. And thankfully, there's not too much of it anyway!

Let's have a look at each of the packages now to see what they contain.

UNDER-SIXES



The eight programs in this package cover shape recognition (including letters), colour recognition, counting, word building, spelling, experiments with number sizes, creative writing using the keyboard, and logical thinking. Other concepts, such as up, down, left, and right are learned incidentally. The teddy bear is used as a recurring character, and even appears as a cursor in several exercises!

TEDDY COUNT is a favourite with children (and me!). This has up to nine delightfully animated teddy bears dancing round the screen. The child has to count them and key in his answer. They then form themselves into a line, and if the answer was wrong they step forward individually to be counted again. If the answer is still wrong they count themselves for you. **FIND THE MOLE** has five molehills numbered according to size, one of which conceals a mole. The child has to guess which by keying in a number. If correct the mole emerges from his hill. If wrong the child is told whether the correct molehill is bigger or smaller and repeats the exercise until the correct answer is obtained.

COLOUR TRAIN has a steam train chuffing along a track passing through coloured stations. The child has to stop the train at the station painted the same colour as the train. If he succeeds various passengers get on and off the train, which then changes colour, and the process is repeated. Again the animation is smooth and detailed, including touches such as puffs of smoke coming from the train's funnel. **TEDDY BEAR'S PICNIC** is a maze game in which the child guides Teddy through a maze of trees to find his picnic. This gives practice at logical thinking to negotiate the maze, and co-ordination of up, down, left, and right movement to steer Teddy to his food. **SHAPE SNAP** is a fairly simple exercise played like the card game Snap. Shapes are displayed onscreen and if they are the same the child presses the spacebar to indicate Snap. If different, he presses any other key. Higher levels use letters rather than shapes to introduce the concept of the alphabet.

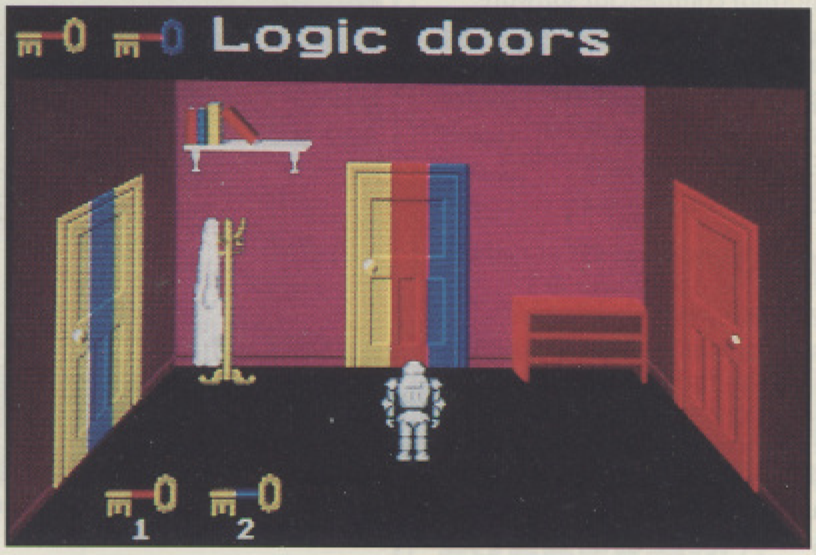
PICK A LETTER takes this a stage further. A letter is displayed and the child has to guide Teddy to find the same letter in an alphabet grid. The letter is then picked up and guided back to an answer space. Higher levels use words rather than single letters, introducing the idea of spelling. **SPELL A WORD** is yet another stage forward, and is similar in concept to B.Spell also reviewed in this issue. A picture is displayed and the child has to spell the word it represents using the keyboard. This could be confusing to young children as the keys are marked with capital letters.

WRITE A LETTER is the final stage of experimenting with letters and words. It allows the child to experiment with writing in the form of simple phrases, sentences, or even a little story or a short letter to someone. In fact it's his very first word processor!

SIX-TO-EIGHTS

The second package of eight programs use some of the concepts from the first set, but in a more advanced way. Counting is extended to become arithmetic and is exploited by several programs, the idea of co-ordinates is introduced and an overall higher level of comprehension and logical thinking is required. Again, there's a recurring character and this time it's an amusingly animated frog.

NUMBER TRAIN is an extension of Colour Train from the first package. As the passengers embark and disembark the child has to work out how many people are left on the platform. **MATHS MAZE** continues the maths topic. Here the frog has to be guided along stepping stones, some of which are occupied by robots. To pass these the child has to correctly answer an arithmetic problem. **NUMBER JUMP** provides a painless way of understanding the concept behind multiplication tables. The child has to guide the frog across a pond by jumping only onto the lilypads marked with multiples of a given number.



SHOPPING helps with reading, comprehension, and co-ordination skills. The child has to read a highlighted item from the frog's shopping list and then guide him to the correct shop to buy it. The exercise ends when the frog has purchased everything on his list.

BOUNCE is designed to encourage co-ordination and logical thinking, The child aims a ball so that it hits an apple afer bouncing off various walls and obstacles in its path. It's probably the most difficult exercise in this package, and is challenging even for adults!

TREASURE HUNT introduces the idea of co-ordinates. The child keys in grid co-ordinates to guide the frog to a particular grid square on the treasure island. He's then told how close to the buried treasure he is by the 'colder/warmer' technique.

PACKING has the child guiding the frog to pick up shapes which have to be fitted together to form a rectangle. In the highest level one of the shapes may have to be rotated to make it fit correctly.

CATERPILLAR is an amusing Hangman type game, where the child keys in letters to find a hidden word. If a letter is correct it's put in its correct position and the caterpillar moves closer to an apple. When the word is found the caterpillar chomps his way noisily through the apple.

OVER-EIGHTS

In this package the programs are linked in that the first seven each provide a password if completed correctly. These passwords are needed to successfully complete the eighth program. The exercises presented here will challenge the child's reasoning and logical thinking skills and should be advanced enough to keep the brightest of children occupied for quite a while. The theme character is a robot this time.

BUILD A BRIDGE is a more complicated version of Packing described above. Coloured shapes have to be fitted together to fill the gap in the bridge. Its higher level has more shapes than are actually needed, making the exercise a little harder. **SOUVENIRS** mixes a little geography and maths. The child has to plan a route through Europe visiting each country only once, buy a souvenir in each one, and end up back in the UK. He's given an amount of cash in Sterling, but buys souvenirs in local currency using a specified exchange rate for the currency conversion. At the highest level the countries' flags are shown instead of their names, so the child has to be able to recognise these. **CODE BOXES** introduces the child to coded numbers. He has to deduce the coding system, in reality a base change, from the clues given.

MYSTERY MACHINE requires the child to decipher the code used to encrypt the instructions to operate the machine. The exercise is completed by following the instructions made visible by successfully cracking the code. **PASSAGE OF GUARDIANS** is a similar idea to Maths Maze from the previous package.This time the child has to get his robot past the Guardian Robots by solving anagrams.

UNICORN has the child controlling a robot in order to carry a bird, a worm, and an apple one-by-one through a forest maze to where the Unicorn lives. All is well while the robot is present, but when some are left alone together then trouble starts. I won't spoil things by telling you what happens, but solving the problem can be quite a challenge, especially as there's a time limit imposed by the forest burning down! **LOGIC DOORS** is undoubtedly the most difficult exercise of them all. It requires the child to find his way through a maze of rooms, each separated by coloured one-way doors. Keys of matching colours to open the doors are scattered around the maze, and to finish the game you need to open all the doors in the correct sequence with the correct keys. There's a practice level allowing you to map the maze and locate the keys first, but you won't be given the password completing it this way.

ESCAPE, the eighth program, is another maze exercise similar to Logic Doors but without the keys. At certain points your way is obstructed, and to get past requires the correct passwords obtained from the previous programs. Each password can be used only once, so again mapping is advisable.

Unfortunately, in the review copy Souvenirs and Logic Doors seemed to have bugs preventing their completion. This meant two passwords couldn't be obtained so Escape couldn't be completed either. Database are now aware of these, and hopefully should have fixed them by the time you read this.

CONCLUSIONS

There's only one word to describe this collection - fantastic! Never before have I seen educational material presented in such a professional and entertaining way, the nearest probably being some of the Disney programs. Pete, my seven year old son, can't leave them alone and keeps coming back for more. What better recommendation can there be for educational programs!

FUN SCHOOL 2
Under Sixes
Six to Eights
Over Eights

£19.95 each

Database Educational Software



B BYTES Educational Software

A small independent software publisher proves that you can produce educational software that is low in cost but not in quality as John S Davison finds out

B.Ware is a new software company set up by Atari dealer B.Bytes Computer Systems of Hinckley. Their intention is to use local programming talent to bridge the gap between public domain and normal commercial software, supplying all that useful educational, small business, and household software most software companies ignore. Prices will be kept low by using simplified packaging and printing, compressing code and data to fit on one single-sided disk where necessary, and by eliminating fancy gimmicks. Here we have their first offerings in the educational category.

B. SPELL is a spelling and letter pronunciation aid aimed at 5-8 year olds, with options for 5-6 and 7-8 age groups. It's designed for ease of use by young children so is totally mouse controlled, allowing the child always to work with screen displayed lower case letters (as taught at school) rather than the confusing upper case letters on the computer keyboard.

The program's main screen is simple and colourful and contains several large icons for selecting various options. Letters of the alphabet are laid out in order round the sides and bottom edge, and during the program's lengthy load cycle each letter flashes in turn as a ladies voice pronounces it phonetically. The speech, (digitised by AVR ST Replay cartridge) is so clear you can even hear her soft Leicestershire(?) accent!

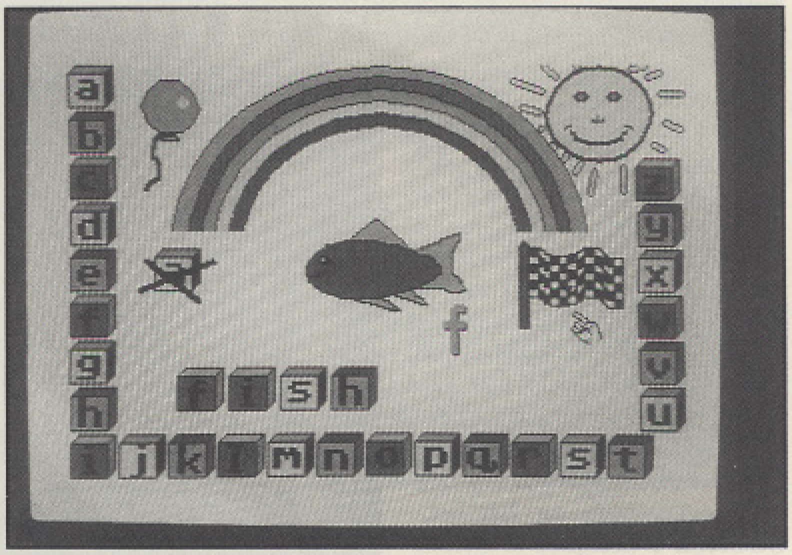
To use the program a letter can be chosen by the child or picked randomly by the computer. A word beginning with that letter together with a bold, bright picture illustrating it are then loaded. For 5-6 year olds both word and picture are displayed onscreen, so the child can copy the spelling by finding and clicking on the same letters in the screen edge alphabet. For 7-8 year olds the picture only is shown, so the word first has to be correctly deduced from the picture before it can be spelled out.

As each letter is selected it's placed onscreen and pronounced by that nice lady again. Mistakes can be corrected by clicking on the 'rub-out' icon and a replacement letter selected. A click on the chequered flag icon signals the word is complete and if the spelling is correct a voice (male this time) says "Well done!" and the child's efforts are 'rewarded' with a burst of excruciatingly painful nursery rhyme music. If the spelling is wrong the lady says so, incorrect letters are indicated, and the child can repeat the exercise until he gives the correct answer.

B.Spell comes with a set of 26 pictures, one for each letter of the alphabet, but is designed for use with additional picture sets. You can produce these yourself with the aid of the utility program described below.

B.SPELL CONSTRUCTION SET is available for just £5.00 extra if you buy it with B.Spell, or £9.95 if you buy it separately. To fully exploit B.Spell you really need this program, so it's wise to buy the two together and save yourself a fiver. You'll also need a separate art program (Degas or Neochrome) to actually draw new pictures. I tried it with the public domain version of Neochrome and everything worked fine.

To fit everything onto one single-sided disk B.Ware had to compress five of the file groups supplied. Before use these must be decompressed, a once-only operation easily performed with



B.SPELL as well as colourful graphics, it speaks to you!

the ARCX.TTP program provided. One file group contains a complete set of 26 additional pictures ready to run with B.Spell. The others provide (in Neochrome and Degas formats) a set of 26 pictures you can modify plus a set of 26 empty picture boxes for drawing your own pictures from scratch.

When a new set of pictures has been drawn, the Construction Set is used to convert them to B.Spell format, associate a word with each picture, and write everything to disk. They're then ready for use with B.Spell. You can also add single pictures and words to, or correct words on, an existing B.Spell picture disk if required. And that's really all there is to it - simple but effective!

B.Ware have started a 'swap shop' for B.Spell picture disks. Send them a disk containing a new set of pictures and £2.99 and in return you'll receive another disk containing FIVE sets of pictures for your own use. Also, they'll soon be selling ready-to-use picture disks for £5.00 each.

KIDSOFT SCHOOL TIME MATHS is B.Ware's first offering in the maths area, and is aimed at five year olds and upwards. It consists of seven different options covering simple counting, addition, subtraction, and multiplication exercises.

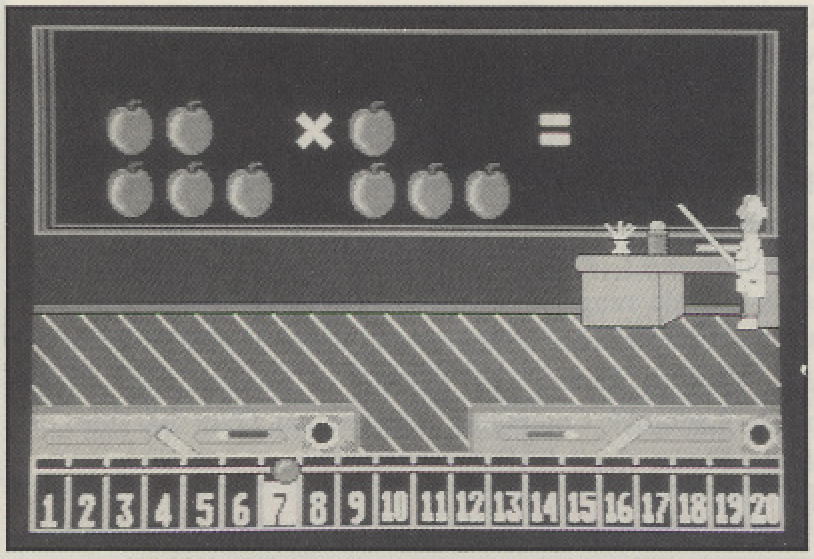
Young children grasp the concepts of arithmetic more quickly if they can actually count the occurrences of recognisable items rather than trying to cope with something as abstract as numbers. So, this program can replace pure numbers with the corresponding number of pictures of everyday objects. For instance instead of the number 3 the child is shown three bananas or whatever the program chooses from its large set of pictures. Once the child understands the concept, actual numbers can be used instead.

A single screen is used for all seven options. This depicts a classroom, with a large blackboard spanning the wall facing you. Walking up and down in front of this is Teacher, who takes the child through a series of problems of the chosen type. To help

the child there's an abacus along the bottom of the screen, and this may be used for working out AND entering the answer to a problem.

The abacus has twenty numbered positions on it, any of which can be selected by using the mouse to slide a bead to the required number. For instance, the sum 3+2 can be calculated by moving the bead to 3 and then moving it 2 places to the right to arrive at 5. A click on the mouse then enters this number, which glides up onto the blackboard as the child's answer.

As the abacus can only count up to twenty it follows that no problem can have an answer greater than this, which means all problems are very simple, however as the program is aimed at very young children this is all that's needed. Exercises in division were omitted for the same reason.



KIDSOFT MATHS - Pay attention teacher's watching!

All exercises are conducted in the same way. Teacher starts at the left of the blackboard and moves across placing pictures or numbers and arithmetic symbols on it to construct the problem. As he does so he SPEAKS to the child (Leicestershire accent again?), orally stating the problem. If pictures are being used he counts the items onto the screen one-by-one, thus reinforcing the concept of counting.

Correct answers result in a "Well done!" from Teacher and - you guessed it - that painful music again! Mistakes result in a short burp or two from the sound chip as the correct answer glides onto the blackboard to correct the error.

Each exercise involves ten problems after which the child is shown onscreen how many correct answers he gave. Teacher doesn't actually speak this information, which is a pity.

OVERALL CONCLUSIONS

These programs are first class and should prove genuinely beneficial if used appropriately. Young children will love the colourful graphics, sampled speech, and who knows - even that awful music! Overall quality (music excepted) is excellent and all the programs worked flawlessly during the review period.

B.Ware must be congratulated on this venture, and on the eminently sensible policy behind it all. I hope we see more from them soon, as current evidence shows their products provide unbeatable value for money.

B.SPELL - £14.95
B.SPELL CONSTRUCTION SET - £9.95
KIDSOFT SCHOOL TIME MATHS - £14.95

POLICE QUEST II

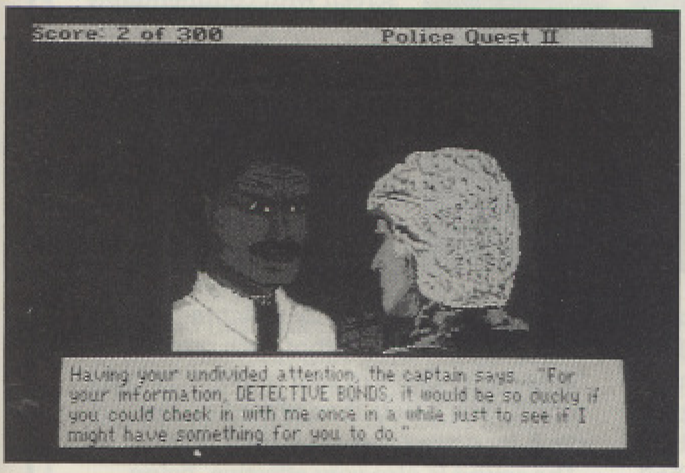
The Vengeance

I don't particularly like to compare a 'new' game with it's predecessor as I believe a game should be judged on it's own merits - yet this is necessary with a sequel, and what a sequel it is!

The first Police Quest followed the hunt and subsequent apprehension of one Jessie Bains. Now he's out! The Jailer is dead and you are once again cast in the role of Sonny Bonds, charged with the ultimate capture of the Death Angel. Time has naturally moved on since PQI and you are now a Detective, still based at Lytton, but assigned mainly to homicide cases. To add further intrigue to the quest, and possibly increase your vigilance, your girlfriend has also been kidnapped by the Death Angel .... and she left you such a sweet message!

The game documentation boasts your involvement in underwater scuba missions, handling a skyjacking and the safe disposal of possible explosive situations. All the skills necessary to carry out these tasks have to be learned and practised as you progress deeper into the game.

The graphics in this sequel are verging on the superb, with far greater detail shown and much more use made of the objects situated in your on-screen vicinity. Try playing with the Sierra computers in any of the offices and check out your rear-view



mirror when driving along to see what I mean!

As with all Sierra games the motto is: SAVE OFTEN - SAVE EARLY. Clues abound in the not-so-obvious areas, such as the numeric code for your personal locker (flip the business card that you should have found in the glove compartment of your initial location!).

Police Quest II is based on real life in a U.S. Police Department so, as you can well imagine, the scenario is vast and the situations are inexhaustible! A thorough reading of the Homicide Officer's Guide (enclosed with the game), is a must, if only to learn the correct wording for the various U.S. Police procedures - remember 'ADMINISTER FIELD SOBRIETY TEST' in the first one?!

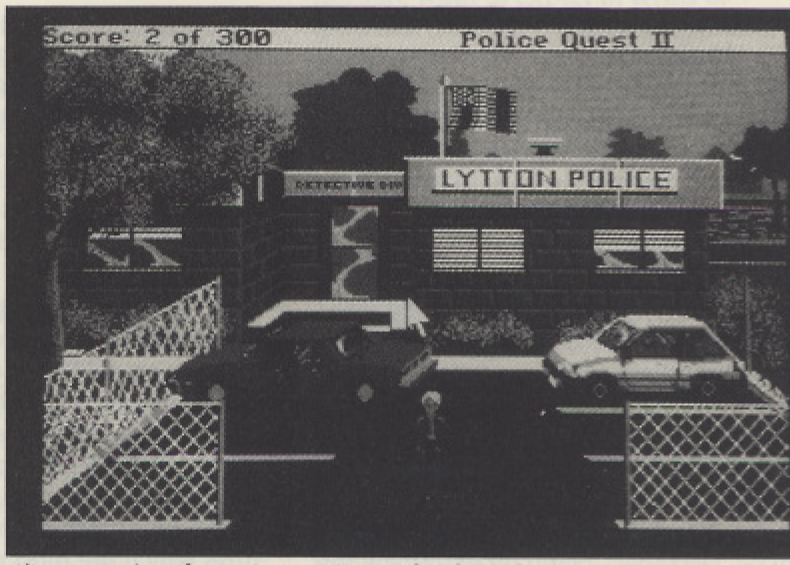
Most inputs are understood and acted upon ... eventually! On the 520ST it seems rather a long time for everything to happen, yet I can assure you that the wait is well worth it! As usual I tried a varied input and was subsequently corrected several times ... a glove LOCKER doesn't exist yet a glove COMPARTMENT does, and ear MUFFS can be requested and obtained yet only ear PROTECTORS can be used!! Minor points really, but it shows that even with a comprehensive vocabulary, the best games (players?) are easily fooled!

Most doors open automatically for you, but not all. I was particularly pleased to find that I didn't have to try and manipulate my car around Lytton - just 'DRIVE TO (wherever)' provided you have previously justified your journey! There are two main areas you MUST check out before leaving the Police Station, these being your Storage Bin in the entrance hall, where you find your 'Field Kit' and your Locker, where you find the rest of your equipment. Examine all locations and TALK to everybody, you never know what you may learn!

I'm not going to spoil things for you by going any further into the game and revealing too many of the treats in store, but I can say that this game really is a pleasure to play, almost like controlling a film!

One final, and important, point that must be raised is the fact that these later Sierra On-Line games require a DOUBLE-SIDED drive, but you will find an offer of exchange for single-sided drive disks enclosed in the game packaging, provided you enclose a further ten dollars for this service! As it stands, the game comes on 3 double sided disks.

You may be somewhat disappointed to learn that Jim Walls - the author of both Police Quests - has no immediate plans to



write a third in the foreseeable future, but the the good news is that Sierra have commissioned him to produce 'Operation Code Name: Ice Man' - a new undercover spy thriller about hi-tech weaponry and hi-tech crime. This should hit the United Kingdom about this time next year, all being well. •

reviewed by John R. Barnsley

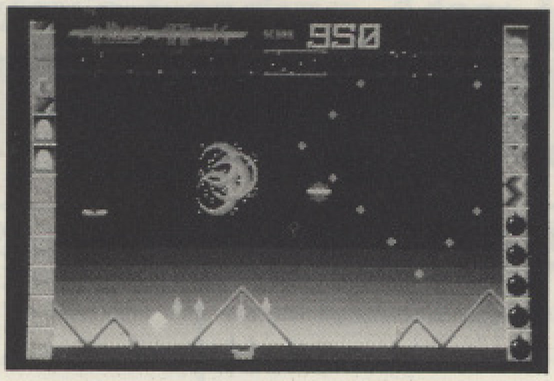
POLICE QUEST II
Sierra On-Line
£24.95

SOME CLUES FOR GETTING STARTED

DON'T READ IF YOU DON'T NEED HELP!

(a) Read the game manual!
(b) Check out both your storage bin (by the counter) and your locker (first one you come to on the LEFT of the Locker Room).
(c) The reverse of the business card will open your locker!
(d) Open the filing cabinet and read the named files for further information.
(e) Check out the Firing Range and don't forget to ask for ear protection.
(f) Listen carefully to what your superior tells you and don't forget to get authorisation before you go elsewhere.
(g) You want to drive around? Get in your car and DRIVE TO THE AIRPORT .... see what happens!!
(h) You did know you had some money with you, didn't you?
(i) SAVE OFTEN - SAVE EARLY!

ANDES ATTACK
Llamasoft
£9.95



Reviewed by John Davison jnr

Reviewing a program written by Jeff Minter is always a pleasure. His strange sense of humour is evident throughout his games, from the highly amusing instruction sheet to the game itself. Andes Attack is no exception to this. It is, in fact, a complete rework of Jeff's very first game, which was released on the VIC-20.

The objective of Andes Attack is to fly your fighter craft over the planetoid defending the friendly llamas from attack by the evil (and now infamous) Zzyaxian empire. The empire's intention is to abduct the animals and transform them into crazed mutants by using the llamas' internal organs. In appearance and style 'Andes Attack' is very similar to the old classic 'Defender', being an extremely fast horizontally scrolling shoot 'em up.

The game is controlled using the mouse and keyboard. The mouse is used for movement and the buttons to activate the thrust and for turning around. The keyboard is used to activate the weapons and other facilities which are at your disposal, being the all important laser gun, your shields, and the ever useful smart bombs which destroy everything on the screen.

Gameplay is almost identical to 'Defender' in that you have to shoot just about anything that moves, whilst at the same time deciding whether a smart bomb or the shields should be used. Whilst all this is going on you must also watch your scanner. This shows the entire planet, enabling you to locate the aliens and also to see where the llamas are being taken from, so you can rescue them.

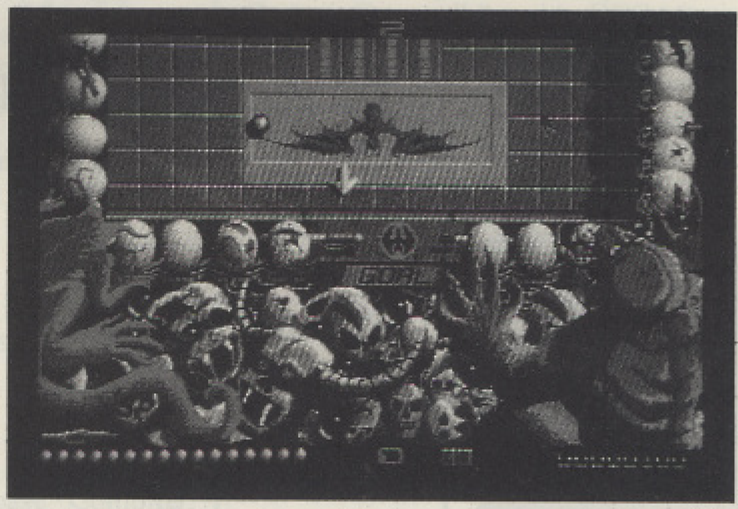
The game contains many nice little features which are most obviously Jeff Minter creations. For example, the pause mode does not merely freeze the game, it enables you to play with the game's sound effects (using the keyboard to activate them) whilst watching pulsating patterns. Throughout the game there are levels known as the "Free Lunch Waves" where all of the enemy craft are of the 'high scoring' variety as opposed to a mixture of these and the lower scoring lander craft which attack the llamas. These levels enable you to rack up huge scores by obliterating everything you encounter. Obtaining high scores enables you to receive extra ships, shields and smart bombs.

The graphics, whilst not being superbly drawn are incredibly colourful. During play, the game screen is a mass of throbbing psychedelic colours which are quite stunning. The audio effects are also very good and come into their own if you play the game with the sound turned up LOUD.

Anyone else would be trying to sell this game at around £20. Jeff however, in true maverick fashion, does not believe that £20 is a fair 'full price' level for games of this type. He maintains they are no harder to write on the ST than on the old 8-bit machines, so there is no justification for charging twice the 8-bit price! Hence the low price of this program. It is a pity the rest of the software industry do not follow his example!

Overall, as with all Llamasoft games, Andes Attack is utterly fantastic. It's incredibly fast, tremendous fun, and a true bargain at the price. If you like a good blast then you'll love this one!

BALLISTIX
Psygnosis
£19.95



Reviewed by John Davison jnr

Every time a new Psygnosis title arrives for review I always seem to start by commenting on the incredibly impressive presentation of their games. From the packaging to the graphics and sound of the game, Psygnosis titles always seem to 'ooze' sheer quality. Ballistix is no exception to this.

The packaging is up to the company's usual high standard, being a sturdy box illustrated with some superb artwork. The game is basically a high speed ball game set in the sports arenas of the future. All of the action is viewed from above the arena and your 'player' is an arrow which is moved around to direct the ball. The aim of the game is simple, you must score more goals than your opponent in order to win the match. Achieving success, however, is difficult as there are a large number of obstacles which hinder your gameplay. Splitters fill the screen with dozens of balls, red arrows speed the balls up to incredible velocities, and tunnels hide them from view. Bumpers cause the balls to fly about at crazy angles and magnets pull the ball away from your control. To move the ball around the arena you must fire smaller cannonball type projectiles at it to push it in the direction you want it to go.

In the one player game you actually battle against gravity on a tilted pitch rather than against the computer itself, and you can take on a real opponent in the two player game. There are a large number of variable settings you can adjust to make the game easier or more of a challenge. For example, the speed of your projectiles can be varied.

The graphics, as one would expect from Psygnosis, are extremely good. When the game first loads the credits scroll up the screen with commendable smoothness, and once this has finished a superb picture is 'rolled' down the screen. The game screens are equally as striking, being intricately drawn. The weird and wonderful members of the crowd can be seen along with the people who are critically watching over the match. At the start of each game a large figure floats in and announces the match. The ball is then placed on the pitch by a rag covered skeletal hand.

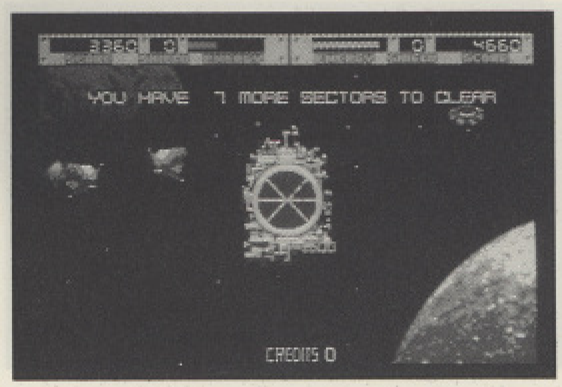
The sound is also very effective, being mostly sampled, especially the speech at the beginning of each game, and the cheers or boos when a goal is scored.

Overall I found 'Ballistix' to be quite impressive, and thought it to be especially good for two players. The graphics and sound are both excellent and the presentation in general is of Psygnosis' usual very high standard.

Looks like Psygnosis have come up with another winner, once again.

BLASTEROIDS
Imageworks
£19.95

Reviewed by John Davison jnr



The press release for this game claims that "Blasteroids, which was a redesign of Atari's classic hit Asteroids, was a huge hit in arcades, combining a highly successful game concept with the latest technology."

On loading the game it is obvious that it is derived from Asteroids, however there are several distinct changes from the original. The most evident difference is the ability of your ship to transform its shape into one of three different types of spacecraft. These ships are the Speeder, with its incredible speed, the Fighter, with immense firepower and the Warrior, which is much larger and has the heaviest armour. There are now five different types of asteroid, some of which are particularly nasty. These include Seekers, which fly straight at you when shot, and Egg asteroids which release Leeches. These beasties attach themselves to you and sap your energy.

Control of the spacecraft is the same as Asteroids in that to move you rotate the ship to face the desired direction then use the thrusters to propel it forward. Other differences are the multi player option, where two players can play simultaneously to defeat the enemy, and also the customisation of the spacecraft, where extra features can be added to make the craft more powerful.

'the feel of an arcade game'

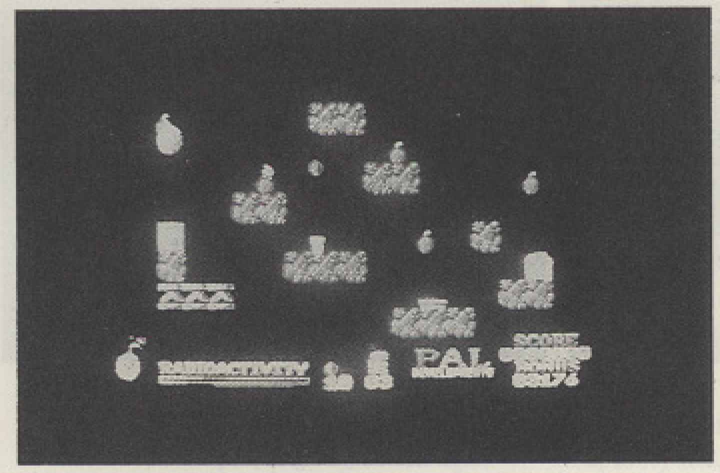
The aim of the game is to clear the galaxies of evil forces and to ultimately destroy MUKOR, the evil ruler of all galaxies. Each sector within a galaxy contains many asteroids which must be cleared. Within the asteroid fields you will also come across various enemy craft which will do all in their power to destroy you. The destruction of an enemy ship of any kind will enable you to pick up a piece of special equipment such as more powerful guns or shields to customize your ship. These extra features make it considerably easier to complete the higher levels.

Upon loading the game for the first time, having not seen the it in the arcades, I was not sure what to expect in terms of graphics. The loading screen did nothing at all to boost my hopes, as it is not terribly impressive, however once the game has loaded it is apparent that a lot of effort has been put into the graphics, as they are of a very high quality. The sprites are all shaded to good effect, being very colourful and smoothly animated. Sound effects are not exactly wonderful however, although this is made up for by a fairly reasonable, if repetitive, background tune which fits the game very well.

Overall 'Blasteroids' is a very well presented game which has the feel of an arcade game. The graphics and sound are of good quality and the game will appeal to fans of shoot 'em ups. My only minor quibble is that it is not exactly the most original of games. Over the years there have been a great number of Asteroid clones, although this is one of the better ones.

BOMB FUSION
Mastertronic
£9.95

Reviewed by Damon Howarth



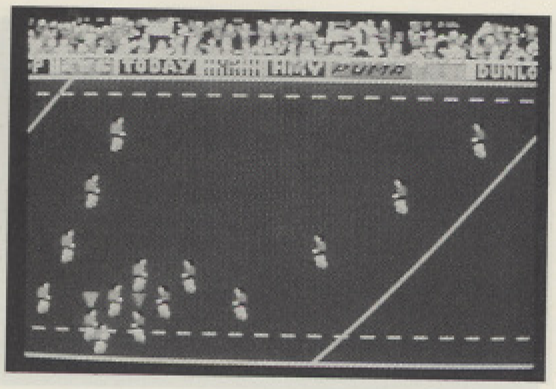
The term budget software has been applied to many variations of quality and style and this game offers no redemption to the reputation that some budget software has of also being budget quality. In this platform game, which owes much to Bombjack, the player is cast as a slightly ineffective super hero charged with defusing a nuclear reactor plant. The fact that he arrives in a "clapped out Sinclair C5" gives away much of the game's origins.

The packaging of the game borders on total misrepresentation, since the screenshots are labelled in small print as Amiga version and show some spectacular, international backdrops. On loading into the ST there are no backdrops and very poor graphics, indeed one could be forgiven for thinking that the colour display and sprite techniques were basically a Spectrum emulation of the early 1980s. It is not a particularly playable game, in so far as both joystick recognition and collision detection are not the most accurate. There are several screens but all are somewhat repetitive, the only actions that are needed are to firstly collect as many parts of what seems to be a paper chain's loops and then put them in a bin while dropping off platforms to defuse the burning bombs. To make life a little more difficult there is a bouncing ball that will drop on you and deplete both your power and your paper chain, this means that it takes more time to complete the level and raises the chances of your destruction.

The background music is thin and repetitive and it is fortunate that there is the option to use a function key to dispel it. There is little to say on the positive side save that it is quite an easy games to play and should you feel nostalgic for the old eight bit budget game then this is a good reminder of the worst of its genre. I was particularly disturbed by the screenshot issue since the packaging of the game would make impulse or non trial based buying a possibility, and although I accept that this sort of packaging has been around for some time it does not make it any more acceptable. I fear for the younger buyer on limited budget who may feel that this is a relatively inexpensive option and looks to have exciting graphics. It is a pity that Mastertronic, who are bringing out some excellent cheaper software have to allow this sort of thing onto a machine as sophisticated as the ST.

There is no way I can recommend this package as there are infinitely superior alternatives on the market. If you see this game in your local store either see it run or avoid with extreme haste.

ADVANCED RUGBY SIMULATOR
Codemasters
£19.99



'the roar of the crowd ... the flash of tartan'

Reviewed by Damon Howarth

The roar of the crowd at Twickenham, the flash of Murrayfield tartan and the echoes of Land of My Fathers washed over me as I looked at this package. On loading it showed a well designed screen with suitable soundtrack and it's option screen gave a well thought out menu system activated by the joystick. The mouse has to be replaced with a joystick to facilitate control in this eight a side simulation of Rugby Union.

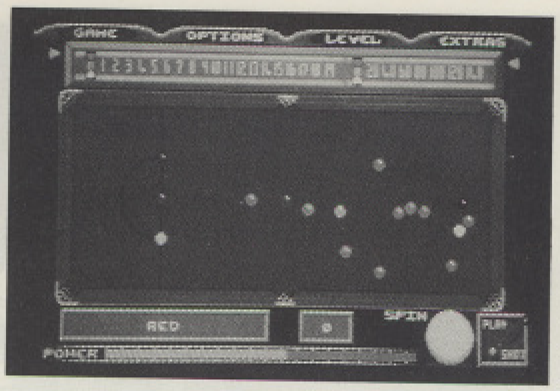
The options available offer the player either computer or human opponents and even goes as far as allowing up to eight people (with optional computer) to partake in a league, which would prove excellent in clubs or similar establishments. It is possible to designate various playing formations and styles and even to select names and colours for your teams as opposed to the default countries. Once all these decisions have been made, or ignored if you just want to play selection of the playing mode takes you onto the pitch for the kick-off.

The control for this is more than adequate and although it is occasionally a little wayward any problems lie with the skill of the operator rather than the program ignoring the user. Running and passing is by way of joystick direction with the player under control being indicated by a large arrow over his head. It is possible to execute Gary Owens or up and unders with deft control of the stick. The computer provides an opponent of extreme difficulty, there is a definite sense of achievement in scoring against it, but as in all such games the true beauty is in its two player mode wherein both participants can blunder away while learning without conceding embarrassing losses.

The area that needs most practice is the drop kick since the written instructions are most imprecise on the matter and it entails a great deal of well timed pressing of the fire button. This feature can regularly lose the match against the computer and Scotlands kick ahead tactics are very hard to recreate. It is vital that this function is learnt to enjoy the game to it's full potential. The kicking is perhaps second only to the scrummage procedure wherein frantic waggling of the stick will gain possession of the ball.

The sub screen following a score is entertaining in so much as most occasions show just a cheery and partisan crowd but every so often Erica Roe will streak across the screen for light relief! Other similar little touches add to the general atmosphere of the game. Even as an American Football addict I found this game most entertaining and far better than many soccer simulators, I recommend this to any computer sportsters with the slightest interest in Rugby.

STEVE DAVIS WORLD SNOOKER
CDS Software
£19.95



Reviewed by Damon Howarth

Snooker games are becoming one of the most populous forms of simulation in the computer world. The ST has many of varying standards and, I am pleased to say, this is one of the better ones. CDS have come up with a formula which reflects the thought behind pocketing balls rather than a contest of drawing lines behind balls or catching cyclical lines.

The packaging is as sober as the game of snooker itself with a black box and a photograph of Steve 'interesting' Davis on the front, the supplied booklet is, however, detailed and explains the rules of all the baize and ball variants it is capable of playing. Each uses the same friendly control system of mouse input and menu control for strength, spin, direction and even position of the white when necessary. There is even a magnify option for close ups on tricky shots. The cue action is determined as a matter of where you want the ball to travel rather than angle of cue to ball. There are six levels of play ranging from Novice through to Steve Davis and a variety of opposition consisting of either the computer or another player and a choice of who breaks first.

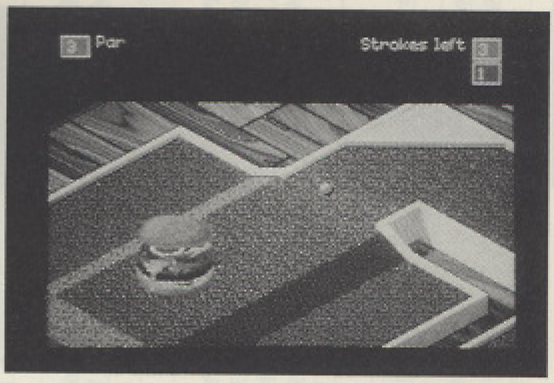
There is, the now mandatory, speech synthesis to inform the player of points scored, penalty strokes or whose turn it is and some excellent title music sampled from pot black. In the game sound effects are purely those of ball on ball in a series of clicks which do not bear a great resemblance to those heard at the average snooker hall. That apart it does lend itself to promoting the serious contemplative atmosphere of the game.

The most entertaining thing about this game is the number of other variants that are available all of which are as faithful to their original as the title game. There are the two forms of pool (American and British) but sadly the British version plays in the Yellow and Red ball version rather than the spots and hoops of my youth. There are also two forms of billiards available in the form of Cannon and standard. In Cannon there are no pockets and all points are scored through the Cannon shot in various forms. It is perhaps the billiards mode I found most entertaining especially since on lower levels the computer is as prone to silly mistakes as normal mortals in real billiards halls.

The control system is the same throughout with only minor adaptations to the choices to suit individual requirements, for example snooker will request which colour is to be nominated during a break whereas American pool will ask for pocket and ball nominations.

On the whole I felt this to be an enjoyable and highly playable simulation and feel it leaves many of its rivals snookered!

ZANY GOLF
Electronic Arts
£24.99



Reviewed by Damon Howarth

Memories of sunny Sundays on Morecambe Pleasure Beach, sticky rock and sand in the toes are evoked by this most pleasant of programs. The design is fiendishly simple and like all the best ideas demanding of great skill.

The basic idea is to emulate the crazy golf courses of most popular seaside resorts but with some electronic twists. Sadly there are some American overtones to this most British of ideas but they do make the game even more whimsical and thus may be forgiven. The packaging of the game is adequate in the standard CD style box and there are sufficient instructions to make the game playable straight away.

There are nine holes on this course each totally different from the other, the method of putting your ball is via mouse control. First position the cross hair over the ball and pull back leaving a dotted line as a sort of power marker behind it then release the button and the ball is on its way. So far so good, but obstructions get in the way. For example the hamburger that squats over the second hole and jumps up and down necessitating timing in the holing out of shots. Many shots need a skill that would be envied by Steve Davis as trajectory and trigonometry come to the fore to make successful putting possible.

Not all holes require the same skill, some require pinball skills, others require the accurate placement of a first shot to set up a final putt, indeed each of the nine holes presents its own problem. The game ends at the end of nine holes or, as is more usually the case, the allotted number of shots runs out and terminates the game early. Sadly this feature means that the unlucky player cannot ever finish the game since running out of shots means a total restart. This is infuriating but equally

'with its realistic bouncing Big Mac and squirting Sauce bottle'

challenging adding to the addictive flavour of the game. Bonus shots are obtainable by rolling the ball over a random fairy or completing a hole in as short a time as possible these shots allow an extension of game time. Some holes have a graphic humour such as the Hamburger Hole with its realistic bouncing Big Mac and squirting Sauce bottle. My particular favourite is the Fan Hole in which the ball is guided round the adequately scrolling maze by mouse waggling and activating fans to blow it in the optimum direction. Most frustrating is the Ant hill hole, which moves with the ants, all very strange!

The game is playable by up to four players which allows for sociable use of the computer and owing to the fact that it does not rely on high speed reactions and multiple deaths of helpless aliens is attractive to a family audience. Indeed so fascinating was the artwork and graphic splendour that even my 70 year old mother (really!) found it enjoyable and possible to play. This is a definite U certificate of a game and as such lives up to its seaside origins. Highly recommended.

BARBARIAN II
Palace Software
£19.95





Reviewed by John Davison jnr

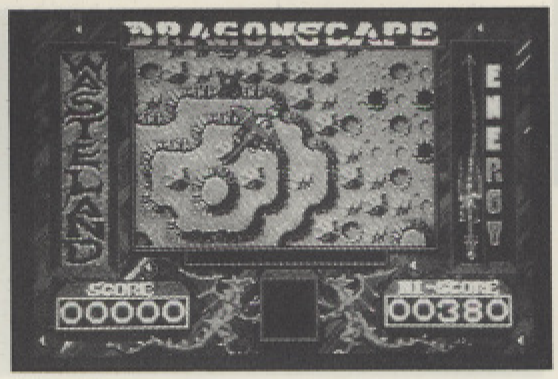
At the finale of Barbarian - 'The Ultimate Warrior', the fantasy 'beat 'em up' game released last year, the hero managed to defeat the evil warriors of Drax thus freeing the Princess Mariana from his evil spell. As a result of this, the evil wizard fled to the dungeons which lie beneath his black castle and he vowed that he would wreak havoc upon the Jewelled Kingdom. The powers that be decide that the only way to stop Drax from succeeding in his evil ways is to send someone to destroy him. The Barbarian and the Princess Mariana (an accomplished swordswoman) are the only two warriors within the kingdom who are skilled enough to survive the perils which exist within Drax's lair.

The game begins as you select your character, be it the Barbarian or Mariana. The selected warrior then walks towards the dungeon and the first level of the game loads. Your warrior must fight through three levels - the Wastelands, the Caverns and the Dungeons before reaching the final level, the Inner Sanctum of Drax. Each of the first three levels consists of a maze of approximately twenty eight screens. As each screen is viewed it is possible to move your character left, right or into doors or caves which can occasionally be found at the back of the screen. As you travel through the levels you will have to battle with a variety of beasts ranging from dragons to crabs until you finally reach the evil Drax. Magical objects can also be found on your travels which will assist you in various ways throughout the game.

Graphically, the game is superb. The backgrounds are colourful and well drawn, and the sprites are all large, detailed, and superbly animated. One of special note is the Dragon in the wasteland, which is really huge! The sound which accompanies all of the characters and their various actions is very amusing. As far as I can tell, all of the sound in the game is sampled, from the 'Vincent Price' type speech heard as you select your character, through to the Dragon burping as it swallows your head having bitten it off!

Overall the game is extremely good and it is obvious that some considerable thought has gone into it. As well as being impressive to look at and listen to, Barbarian II is also a highly playable game which holds your attention for considerably more time than its predecessor. If only other well-hyped games could do the same we'd all be well happy!

DRAGONSCAPE
Software Horizons
£19.95



Reviewed by Damon Howarth

You have been transported through time and space to beautiful Tuvania to protect it against evil invading aliens. The only ally that you have is Garvan a good hearted if slightly mentally retarded dragon, your mission, should you choose to accept it, is to pick up and replace the various artefacts strewn around the country and to depose the king of Kaos thereby becoming a hero and saving the world. This makes as good a scenario for a fast moving sixteen way scrolling arcade game as any and the game that accompanies the plot, Dragonscape, is a good example of the thinking man's scrolling shoot 'em up.

The loading is ominously quiet and the loading screen deceptively peaceful but once the game has loaded the music begins. It is good strong music with the occasional sampled voice in it and from there the gameplay gets better. The sprite representing your steed and self is exceedingly mobile and very, perhaps overly , responsive to the joystick and the enemy are equally well defined and most deadly. Your only weapon is manoeuverability and of course dragon breath, a tried and trusted method of reptilian self defence. The game is fast and as such mistakes are costly with your dragon's skin flaking off to reveal skeleton below, once the skeleton is fully revealed the game is over.

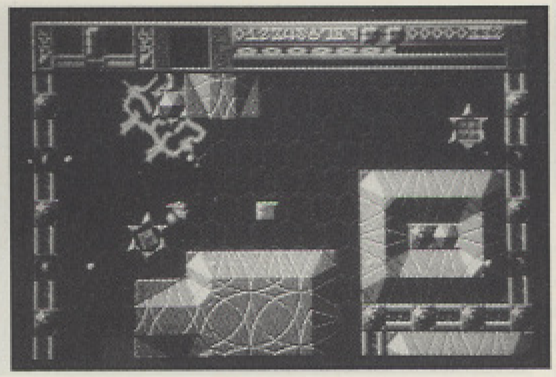
It is necessary to obtain various icons representing lost artefacts and replace them within the place they came from. For the most part the relationship is obvious such as the arrow to the elf bow or the skull to the skeleton. It is important to remember where all these essential things are, since time is limited in each level and it takes furious flying, dodging and grabbing to complete a level. As in most of these type of games, on completion of a level another large revolting creature needs to be killed before further progress can take place.

The only problem with Dragonscape is the small playing area which precludes forward thinking and, after many games, forces the player into remembering previous positions. The effect of this is frustration with the unseen and a claustrophobic feeling during play, otherwise the system is a credit to Software Horizons.

I found the game a change in the scrolling, shooting market since it allowed for an element of simplistic arcade adventuring and the exercise of brainpower as well as finger power, it is also good to see one of fantasy's less loved creatures being cast as the good guy for a change. I wondered whether there was some Anne McCaffrey influence on the writers since the plot is related to much of her Pernese material. For those who are good at scrolling games and even for those new to the concept this is a worthwhile choice that will prove absorbing and challenging for some time.

'absorbing'

FUSION
Bullfrog/Electronic Arts
£24.95



Reviewed by John Davison jnr

This release from Bullfrog/Electronic Arts is a scrolling shoot 'em up style game which involves some thought, as it contains a number of puzzles which need to be solved in order to complete the game. The main objective of the game is to collect all of the segments of 'The Bomb' and return to the starting point without destroying your ship.

To move around the alien levels you have a choice of two craft which are available for use at any time. These craft are the Mother Ship which is a large manoeuverable fighter craft and the smaller, less mobile Assault Crawler which it carries. You can swap between the two as long as the terrain is suitable for the Mother Ship to land for the Crawler to disembark.

The various puzzles within the game involve the restricted areas of the alien level known as the 'grids'. These grids can be traversed by the Crawler and in some areas extra features can be collected to modify your vehicle. However, the grids are broken in sections and in order to pass from one to another, switches must be activated by the Crawler to make the new ones appear or move. The whole process, whilst seeming to be quite simple, is in fact incredibly complicated and involves a great deal of thought to actually make the things do what you want them to!

To make matters worse there is a continual bombardment of enemy fire regardless of what you're doing. The 'Enemy', as they are known, really dish it out! There are a large number of missile silos and various nasties scattered about all over the various levels to impede your progress. All this makes the game both challenging and quick paced, a combination which makes 'Fusion' a difficult but enjoyable game.

In terms of presentation 'Fusion' is quite superb. The loading screen is not outstanding, but is accompanied by an excellent, lengthy sampled tune. The game then loads and you are given the option of normal or expert levels. The graphics of the game itself are very impressive, being brightly coloured and shading is used to great effect. It has some unique features too, for example the score is not only written in the universally accepted decimal system, but also in a strange alien script as well. The sound does not live up to the expectations set by the loading tune as it is consists merely of gunfire and various other white noise based effects.

Overall, the game is very good, although I did have a few quibbles. To start with the game would not load on my now aging ST, so in order to play it I had to find a more recent machine to make it work. Secondly, although the instruction manual is fairly wittily written, it manages to obscure what it is trying to tell you by its 'round about' style. Despite these quibbles I still enjoyed the game, as its playability and unique features make it more than a simple mindless shoot 'em up.

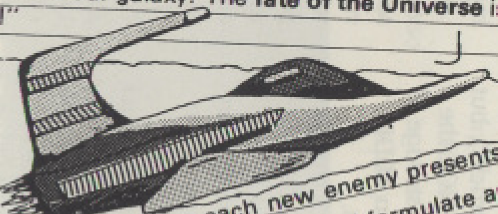
JEFF MINTER'S

Super

GRID RUNNER

Some forms of combat are abstract in the extreme. One such is the 'videogame', In 'videogames', players use levers and buttons to alter the behaviour of small coloured blobs on a display screen. By causing one blob to intersect another blob in a certain fashion, a number displayed on the screen is increased, giving satisfaction to the player and affording the necessary element of competition.
One terrestrial lifeform decided to create such a form of ritualised combat, called *Super* GRID RUNNER

"The Earth is under attack!! The disgusting green Slimelords of the planet Xtharrgg have unleashed heavily-armed space battle fleets against the Earth for **no apparent reason!!** Luckily, we just happen to have a few of the **very latest** Vorton Hyper X-13 UltraStarfighters handy, but there's one problem... only **one pilot** is good enough to fly them... and that's **you!** You must go into battle against the Slimelords, piloting the X-13 over **incredibly realistic** abstract geometric grids! Can you **vanquish** the threat of the disgusting Slimelords and restore **peace** and **prosperity** to the 32x200, 512-colour galaxy? The **fate of the Universe** is in your hands!"



HINTS FROM THE STARFIGHTER'S MANUAL...

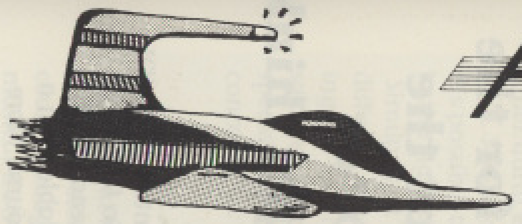
- 7.7 **Know your enemy.** As each new enemy presents itself, evaluate its characteristics and formulate an effective response
- 8.3 **Don't** loiter near screen edges. Something nasty may emerge.
- 8.8 **Be aware** of the positions of active Rail Guns.
- 9.1a Where possible, **destroy** a threat rather than evading it.
- 9.1c Where patterns exist, **learn them.**
- 13.0 **Never** die by the hand of the enemy. Choose Suicide and take advantage of the benefits of martyrdom.
- 21.1 **Don't** shoot your Extra Life goats.
- 21.2 **Please Don't** shoot Bonus Llamas.

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Super GRID RUNNER

A BLAST AND A HALF!

TWO NEW GAMES FOR THE ATARI ST
GREAT GAME PLAY & GREAT VALUE!
FROM LLAMASOFT



ANDES ATTACK

- AS SOON AS I PRESSED THE MOUSE BUTTON I KNEW I HAD TROUBLE - a pair of HASSLERS appeared promptly and slammed in to me. One life gone and little to show.

*To show who was in charge I accelerated towards the descending LANDERS and wrote several of them off - then came the cry for help - a LLAMA had been nabbed by one. Of course it was far off, on the edge of the SCANNER - I accelerated towards it, ducking and weaving and luckily destroying an HACD** on the way. When I got there I carefully shot the lander, caught the llama and put it down on the surface, protecting myself with a dab of SHIELD.*

No relief - I had run into a bunch of seeded mines and an NPB was right ahead. I punched CONTROL for the SMART BOMB but too late, second ship gone.*

*My survival into the next wave was in doubt - time to **Sharpen Up!** As my third ship rezzed in, a MUTANT and a couple of HOVERDRONES appeared - this time the SMART did its stuff. I had a second to breathe, study the Scanner and decide where the most urgent threat was.*

ANDES ATTACK COMPETITION
CLOSING DATE — MAY 30th 1989

Then, two more cries for help, nearer this time and close together. Flying now by instinct I managed to rescue both llamas at once. Wonderful - until the MOTHER SHIP zapped me. They fell to their deaths, from a great height. Six more to die and we'd lose the planet and plunge into a fight in Deep Space.

*No time to worry - two SPORES appeared right ahead - a second Smart saw them off. The next few secs were pretty productive - suddenly the Scanner began to clear but **what was this** - something coming at me FAST! Turned out to be a KUSSTOM BLYTTER and it didn't like me. I trashed it with my shield on an a well-aimed blast, and so into the next wave six of my llamas intact.*

£9.95

* 'Have a Crummy Day' - Mine Seeder
** 'Nasty Pulsating Blob'

ANDES ATTACK

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2 Musical Hardware

John S Davison continues his exploration of MIDI for the layman with a look at the hardware and it's not as expensive as you might think

In Part One of this beginner's guide to MIDI we concentrated mainly on explaining basic MIDI concepts and jargon, and a brief introduction to MIDI keyboards and sound sources (synthesisers). This time we'll look further into MIDI related musical hardware, and at how you might set up your own low cost MIDI system.

Obviously, you need a MIDI capable musical instrument before you can make music via MIDI. Although I'd recommend the novice to start by purchasing a MIDI keyboard with built-in synthesiser, this isn't necessarily the only option. You can now obtain guitars, saxophones, and other instruments equipped to generate MIDI message streams, bringing the joys (and pains!) of MIDI to non-keyboard players. When plugged into a synthesiser these instruments can produce astonishing results - just imagine strumming chords on a MIDI guitar and hearing the thunderous tones of a cathedral pipe organ instead of the expected sound! It's unbelievable! And so is the cost - these instruments tend to be very expensive.

Also, manufacturers like Akai and Yamaha produce non-acoustic MIDI wind instruments which behave like traditional woodwind or brass instruments, but produce no audible sound of their own. Onboard electronics generate MIDI messages in response to the player's finger positions, lip pressure, and breath velocity and these are turned into sound by an attached synthesiser. For much less cost (around £100) Casio will sell you their saxophone-like 'Digital Horn', but this has rather limited capabilities.

HEART OF THE SYSTEM

A sequencer is the heart of any MIDI system, providing the means of capturing and storing a MIDI message stream, so that it can be played back at a later time. In concept it's rather like a multi-track digital tape recorder (usually with 8 or 16 tracks), but it records the MIDI messages used to produce a sound, NOT the sound itself. It usually sports a disk drive for long term storage of the MIDI data. Playback has to be performed through a MIDI controlled sound source to recreate the original sounds.

> **MIDI ON THE XL/XE?**
>
> ***Although MIDI is usually treated as an ST topic, 8-bit users needn't feel left out. Next issue there's a review of MIDI Master, a simple low-cost MIDI interface and software for the Atari 8-bit machines together with news of exclusive offer for readers to purchase MIDI Master from PAGE 6!***

Each track can be recorded, edited to correct any errors, and played back independently of the others. While recording on one track you can simultaneously play back any of the tracks previously recorded, allowing a complex piece of music to be constructed in easy stages. Using this technique it's possible for a lone musician to sound like a whole band in the finished recording.

A sequencer can be bought as a stand-alone piece of hardware, but is often found built into other MIDI devices such as a keyboard or expander module. So far I've described only the dedicated hardware based sequencer, but many musicians prefer the superior facilities available from a software based sequencer - running on an ST, of course! More details on this in the next issue.

SAMPLED SOUND

Another important sound source is the 'sampler'. This exotic device can digitally record a sound 'snapshot' from real life, from an existing recording, or from another electronic instrument. This can then be edited, processed in many different ways, and the resulting sounds stored in the sampler's memory. From here they can be triggered to play back at any pitch by an incoming MIDI message stream, permitting tunes to be played using any recordable sound, including those gimmicky dog barking, breaking glass, and stut-ut-uttering sounds we've all heard before.

As sampled sound is held as digital data it's possible to upload it via MIDI to your ST and manipulate it there using appropriate software. In fact, it's even possible to turn your ST into a rudimentary sampler using products like AVR's 'ST Replay', which use sampling hardware plugged into the ST's cartridge port. AVR also do a similar but even simpler product for the 8-bit machines. Both seem more suited to capturing realistic sound effects for use in your own computer programs rather than as a music making aid, though.

The sampler has caused much controversy in the music world. It's now possible for anyone to steal another musician's unique sounds by sampling them from existing recordings for incorporation into their own work. So, if you wanted an authentic Eric Clapton guitar sound you could just sample it from one of his records and play it from your own keyboard!

Another device worthy of mention is the drum machine. This is a combined sequencer and sound source dedicated to producing percussive sounds and rhythm patterns. Digitally sampled drum sounds are used, so aurally they're pretty realistic. Rhythms are created by a MIDI data stream, coming either from the machine's internal sequencer or from a MIDI message stream generated elsewhere - a MIDI equipped drumkit, for example!

A more advanced MIDI system could include several sequencers, e.g. one in the keyboard and another in a drum machine. To play together they need to be synchronised, and this is achieved using special MIDI positioning and clock messages broadcast to

by John S Davison

all components of the system by a nominated 'master' component. This acts like the conductor of an orchestra, ensuring everyone starts from the same place and plays in time. An extension of this principle allows sequencers to be synchronised with multi-track tape recorders, video recorders, and other studio equipment.

Much modern music is highly dependent on special effects for it's impact, and to get these the raw music is routed through one or more 'effects processors'. These can add reverberation, delay, echo, chorus, sustain, flange, fuzz, stereo panning, and many other aural effects to create whatever style is currently fashionable. MIDI control has been extended to these processors too, so it's possible to automatically trigger the required effects at exactly the right time.

Similarly, it's possible to automatically vary the relative levels of different sounds by using a MIDI controlled mixing desk, allowing the volume of a particular instrument to be boosted during a solo, for instance. Some bands are now even using MIDI with special switchgear to control the stage lighting at their live concerts!

YOUR FIRST MIDI SYSTEM

You probably think it's difficult and expensive to set up and use a MIDI system, but this just isn't so. With care virtually anyone could manage it - you don't even have to be able to play a musical instrument, but obviously it's helpful if you can!

The best bet for the raw beginner is to buy a MIDI equipped 'home keyboard' as these are completely self contained, usually combining keyboard, sound source, drum machine, amplifier, and speakers all in one unit. They often have lots of automatic play 'fun features' too. Until recently the most popular beginner's instruments were Casio's CZ101 and CZ230S, and most low cost MIDI software was designed with these in mind. They're still good buys if you can find them, but they're now out of production. So what should you buy?

There are dozens of different low cost MIDI equipped keyboards around, but beware! Some, particularly older models, have a poor MIDI implementation so make sure the one you buy will do what you want - particularly if you buy secondhand. MIDI keyboards are usually supplied with a MIDI Implementation Chart showing exactly what the instrument can and can't do, so take a look at this before deciding. If possible, buy from a specialist music shop as they should be able to sensibly discuss your requirements and advise you accordingly.

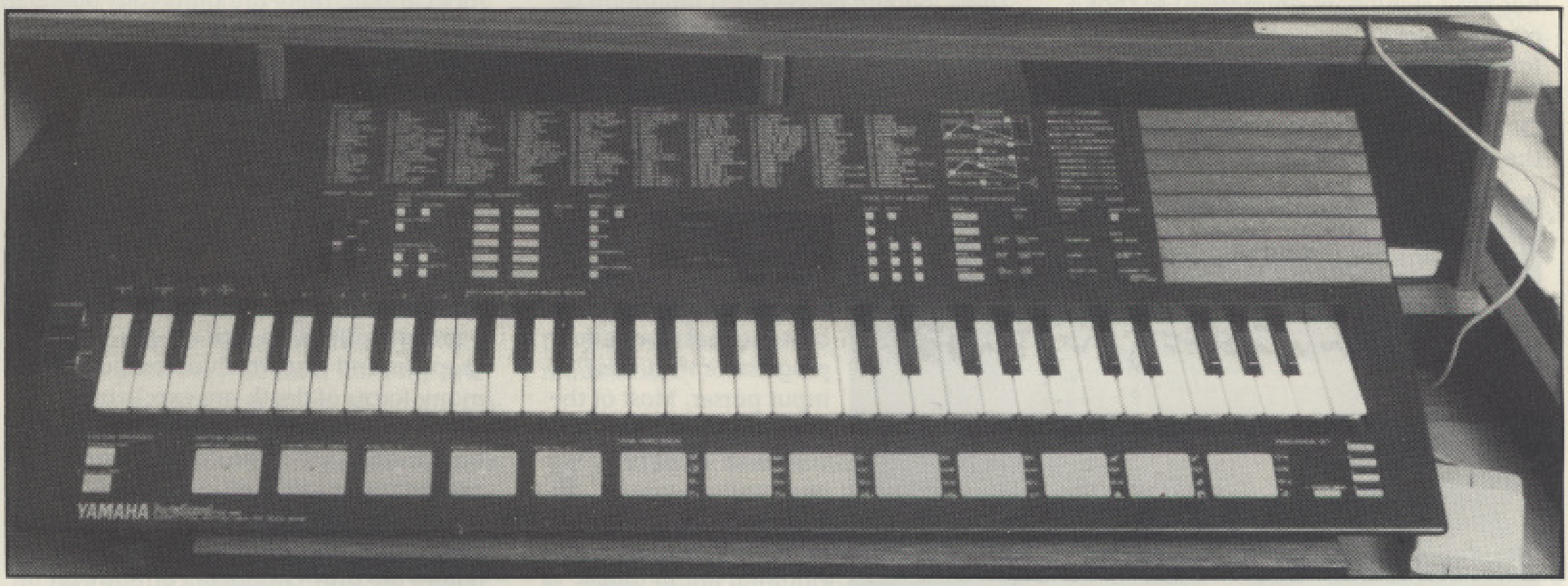
For my needs (and pocket!) the best value home keyboards around right now are Yamaha's PSS-480 and it's bigger brother the PSS-680. These cost around £150 and £200 respectively and offer great value for money. Add £5 for two MIDI cables, £25 for a simple ST software sequencer package such as Activision's Music Studio, and you have a beginner's MIDI system capable of producing some excellent sounds.

Both keyboards have 100 different pre-set instrumental voices, from rock guitars to harpsichords, plus five synthesiser voice registers for building your own patches. In addition there are 32 sampled drum sounds, all accessible via MIDI. Both instruments have 16 MIDI channel support and 12 note polyphonic capability, so can play up to twelve simultaneous notes. Amazingly, they're also 12 voice multi-timbral, so using Music Studio you can play any combination of up to 12 different pre-set and custom sounds at once. With just this one keyboard you can sound like a 12 piece band!

Both also have the full complement of MIDI sockets (IN, OUT, THRU), again unusual at this price level. Additional facilities include pitch bend, stereo chorus, vibrato, reverb, sustain, and portamento to zap up your performance. And, they have stereo outputs to feed into your hi-fi system for infinitely improved sound reproduction over that provided by the small onboard speakers. These and lots of other features put them streets ahead of anything else at the price, both as 'fun' home keyboards and for MIDI use with your Atari computer.

At this price level Yamaha, like all other manufacturers, have to make compromises. The main one is that both machines have mini-keys rather than full size piano keys, although the PSS-680 is unique in having a 61 note keyboard instead of the 49 usually found on instruments in this class. The keys aren't velocity or aftertouch sensitive either, but none of this should be a major problem unless you're already used to full size keys or are REALLY serious about learning to play properly.

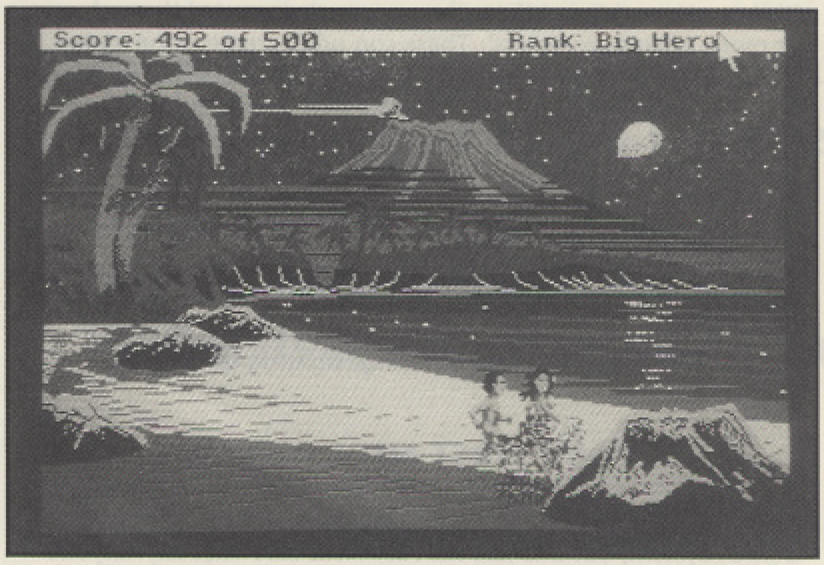
Actually, you can make exciting music via MIDI without even TOUCHING the keys, using a 'step-time' software sequencer like the Music Studio package mentioned above. I'll be discussing this in the next issue, when we'll cover the whole topic of MIDI software. In the meantime, why not visit your local music dealer to hear just what MIDI keyboards can do? Then try to resist buying one!



Yamaha's PSS-680, an ideal beginner's choice with a lot of features for around £200

LARRY'S QUEST and GRAHAM's QUEST

Sierra's initial pioneering work with graphics culminated in 1984 with their first 3-D Animated Adventure Game: Kings Quest. Since then their graphics have gone from strength to strength and these two recent games are even better ... from a graphics and music point of view! Both games support MIDI output to a Roland MT-32 or Casio CZ-101 and KQIV contains forty minutes of original music.

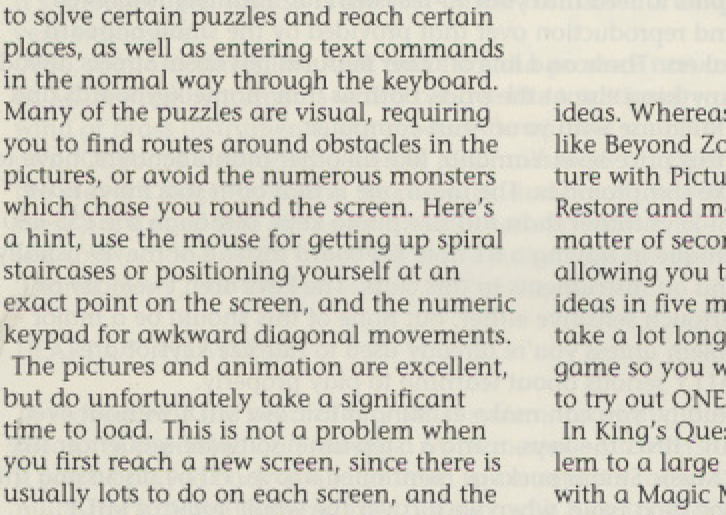


In all Sierra's games the graphics really are integral to the game. You have to use the cursor keys or mouse to manoeuvre your character around the screen in order to solve certain puzzles and reach certain places, as well as entering text commands in the normal way through the keyboard. Many of the puzzles are visual, requiring you to find routes around obstacles in the pictures, or avoid the numerous monsters which chase you round the screen. Here's a hint, use the mouse for getting up spiral staircases or positioning yourself at an exact point on the screen, and the numeric keypad for awkward diagonal movements.

The pictures and animation are excellent, but do unfortunately take a significant time to load. This is not a problem when you first reach a new screen, since there is usually lots to do on each screen, and the responses to your commands are very fast. The system has been enhanced to remember as many of the last few screens as it can (about four on my 520ST - less if there has been significant animation) so that retracing your steps or going back and forwards between two rooms only takes a few seconds.

SAVE and RESTORE are also quite slow so there is a definite inhibitor to trying out ideas. Whereas in a good Text Adventure like Beyond Zork, or a good Text Adventure with Pictures such as Fish you can Restore and move through ten rooms in a matter of seconds, with pictures turned off, allowing you to try out a dozen different ideas in five minutes, in contrast it can take a lot longer to do that in a Sierra game so you will be lucky if you manage to try out ONE idea in five minutes!

In King's Quest III they solved this problem to a large degree by providing you with a Magic Map which allowed you to teleport directly to anywhere you had previously visited. I thought this was a great idea and I really don't understand why they have not continued with this feature. These loading delays are a limitation of the current technology and you just have to accept them if you wish to play this kind of game - SAVE frequently! It may be slightly better on a 1040, it may even be great if you have a Hard Disk!

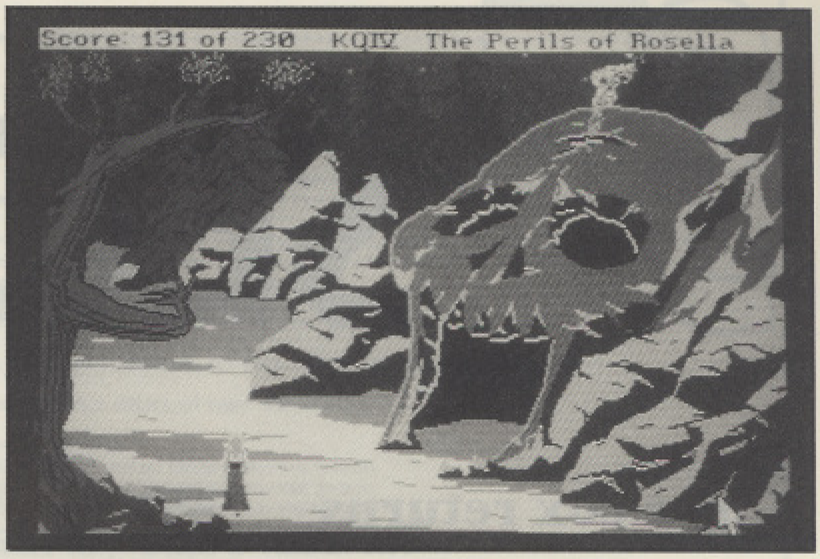


Sierra have obviously put a lot of effort into improving their music, graphics and animation over the years. Unfortunately they have not been quite so progressive with their input parser. Most of the time it is barely able to cope with VERB NOUN, and confuses you by understanding a command in one room but claiming not to understand it in the next!

I won't bore you with the details - you'll suffer enough if you play the games - but it was all typified for me when, in Leisure Suit Larry II, I typed in an extremely simple sentence and it responded with this little gem: "Perhaps you can understand that sentence, but I have graphics to worry about"! On the positive side, they have expanded the graphics area to fill the whole screen and whenever you start typing a command the action freezes and a text window appears for you to complete your typing, also a simple tap of the space bar will recall your last command - an excellent implementation.

Sierra have also added a lot more superbly animated cartoon sequences to the games. As well as a ten minute introductory cartoon, there are numerous points in both games where the program takes over and shows you graphically what happens next, often with some nice touches of humour (but be warned - a lot of it is very 'American' and very 'cute'). These are great the first time you see them, unfortunately, you have to sit through them every time - there is no Fast Forward button. This is made especially annoying by the 'Bang, You're Dead' Syndrome which permeates all Sierra games - yes, the graphics and text which accompany your many forms of death are excellent, but I get awfully bored doing RESTOREs and sitting through the same cute cartoon for another three minutes!

One major drawback, if you only have a single-sided disk drive is that both these games are only available currently on double-sided disks. Julie Barwick of Activision (0734-310003) is trying to arrange for



John Sweeney combines a quest round the noble land of Daventry with some sleazy U.S. bars in two eagerly awaited follow up adventures from Sierra

single-sided replacement disks, contact her for the latest information.

I have so far mentioned many of the negative points of Sierra's games, if only they would give a little more thought to the person trying to solve the game by providing features such as a Magic Map and the ability to skip past cartoons you have seen before, and by putting a tiny fraction of their effort into improving their completely inadequate input text parser, then these games could be really great. For the moment, as long as you can stand those limitations, then nearly all their games are well worth playing. Apart from being entertaining as adventures, they are all full of humour - it is always worth trying stupid things, occasionally they may actually be useful, but very often you will get a joke or sarcastic comment from the game.

KING'S QUEST IV carries on the story line from KQIII. You play the part of the Princess Rosella and you urgently need to find a magic fruit to save the dying king. Unfortunately you can only get home with it if you can save the good fairy Genesta from the evil Lolotte by retrieving a stolen talisman. Unfortunately you can only do this by ... and so it goes. There are lots of puzzles to solve and quests to complete and a whole new land to explore, full of ogres, dwarves, zombies, a unicorn, a troll, and lots more - all beautifully animated and with their own little signature tunes. A lot of the sequences are based on myth, legend or fairy tale and there are few really hard problems to solve.

There are a couple of nasty bits, some of which are a bit unfair so I include a few clues for those who are really stuck - to decode just go back three letters in the alphabet:

1) HDFK WLPH BRX VHH ORORWWH VRPHWKLQJ VRPHZKHUH FKDQJHV
2) DIWHU ORORWWH HASORUH WKH RFHDQ DJDLQ
3) WKH SRXFK KDV WZR XVHV
4) GRQ'W ZDLW IRU QLJKWIDOO - LW ZLOO IDOO HDUOB LI BRX DUH UHDGB IRU LW

Whatever you do don't look at the Official Book of King's Quest if you prefer to solve adventures by yourself - the hints are arranged so badly that it is impossible to find a clue without seeing far too much information about parts of the game you haven't reached yet! .

This is undoubtedly an excellent addition to the King's Quest series and well worth playing if you aren't looking for too much of a challenge and have lots of patience - though personally I thought KQ III was much better.

LEISURE SUIT LARRY II continues the story of Larry. Larry is a nerd - "the most negligible bachelor of the year"! Thrown out by Eve (the lady he, um, er, made friends with at the end of Leisure Suit Larry in the Land of the Lounge Lizards) Larry is penniless, but if you find the right things to do and can stand sitting through a take-off of an American version of 'Blind Date' you too can end up with a Million Dollar Note - which nobody will change! - and a cruise with a beautiful lady - if you can find your passport and if she doesn't send her mother instead! Unfortunately Larry also gets mixed up with some spy business and finds himself the target for a lot of very nasty people without ever really understanding why! Your objective is simple - survive!

I wasn't too impressed by the quality of the puzzles in LLII. There are far too many where you are not given a chance to solve them in advance by logic - you just have to wait until you die (again!) then go back and taking fairly obvious steps to prevent it - and sometimes you have to go back quite a long way! If in doubt try TALK MAN or SIT - there are at least TWELVE of those that will score you points!

And be sure to test for keyboard interaction during the cartoon sequences - although most of them disable the keyboard, there are a few occasions when you have to find the points where the keyboard is activated and enter a command - the programming borders on moronic!

It says 'FOR ADULTS' on the box but I have seen a lot worse in PG rated films. This is definitely downhill from the original Leisure Suit Larry - the graphics and music are excellent and many parts of the game are good fun to play through ONCE, but if you want something to PLAY rather than WATCH it is definitely overpriced.

VDYH EHIRUH BRX SLFN XS WKH GLS - L QHYHU IRXQG D XVH IRU LW DQG LW LV GHDGOB

KING'S QUEST IV:
The Perils of Rosella £29.99
LEISURE SUIT LARRY
goes LOOKING FOR LOVE (In Several Wrong Places)£24.99

Both by Sierra On-Line and distributed by Activision

ST SECRETS

Colm cox returns with some more programming secrets for every-one to share using ST Basic or C

Welcome back! In my last article way back in Issue 32 I took a look at the various hardware registers of the graphics chip and examined the basic software interface between programmer and hardware. In this issue I aim to explore some more of the features offered by the ST in the field of graphics. To begin we look at the basic subdivisions of the GEM system.

GEM (Graphics Environment Manager) can be broken up into two sections - VDI (Virtual Device Interface) and AES (Applications Environment Services). The VDI's functions we will examine are those in the field of graphic production, including drawing shapes - circles, boxes, ellipses - and also the mouse functions - reading the position of the mouse pointer and state of the mouse buttons. All VDI calls have unique numbers - the numbers of the calls I will be dealing with are 3, 6, 8, 11, 12, 32, 103, 106, 122, 123, 124.

The AES handles windows, menus and alert boxes. As this article is concerned with graphics, I'll mainly discuss VDI functions but fear not AES freaks, I won't desert you!

To use any of the functions provided by the VDI you must first tell it you wish to use it - logical eh? This is accomplished by the VDI call OPEN_WORKSTATION. When using a VDI call it may only be necessary to supply its unique number, for example when reading the position of the mouse pointer. In other cases the unique number plus additional parameters are required, for example, drawing a box in a particular position on the screen. The parameters are passed in the following arrays. All values are stored as 16 bit values (2 bytes).

CONTROL: This is the array in which the unique number of call is passed. Also various other parameters which relate to that call are passed in this array.
PTSIN: This array is used to hold sets of co-ordinates (x,y) as input to the call we are going to execute.
PTSOUT: This array contains pairs of co-ordinates, which the VDI passes back to the user.
INTIN: This array is used to pass various parameters to the VDI.
INTOUT: The VDI uses this array to pass most of its results back to the user.

ST Basic sets up its own workstation and five keywords are provided which the system recognises as the base address of its associated array for example CONTRL is the address of the control array.

CONTRL	Base address of CONTROL array
INTIN	Base address INTIN array
INTOUT	Base address of INTOUT array
PTSIN	Base address of PTSIN array
PTSOUT	Base address of PTSOUT array

To execute the call, ST Basic users type: **VDISYS(X)** where X is any number.

The Assembly user must set up a workstation if they wish to use the VDI. As space is in short supply I cannot print the required listing - but if you do need it, write to me - my address is at the end of the article.

Most C's include their own bindings which place the arguments in the required arrays and then execute the call. The code to set up a workstation is:

```
short work_in[12];
short work_out[57];
short handle,i;
handle=graf_handle(andi,andi,andi,andi)
for(i=0;i<10;work_in[i++]=1);
work_in[10]=2;
v_opnvwk(work_in,andhandle,work_out);
```

As you may have noticed, the open workstation call does not achieve everything! However, after this call is executed, a wealth of graphic operations are at your finger tips, including: Draw box, Draw circle, Draw ellipse, Fill surface, Print text in a variety of styles and sizes and clear screen. These commands provide graphic output well beyond that provided by 'normal' ST Basic. The inset block on the next page provides a description of these commands, accessed from ST Basic.

PROGRAMMING EXAMPLES

If you got lost somewhere along the way fear not, Listing 1 shows how to access the VDI from ST Basic and is fully commented.

Before I describe the listing, one particular location merits note - **SYSTAB+24**. From ST Basic, POKE SYSTAB+24,1 disables GEM. The menu, windows, keyboard input - including Control G and ST Basic graphic commands are disabled to improve execution speed. When you use this POKE any errors in your program will hang the system because as mentioned above keyboard input is disabled. You should test your programs without this POKE and when you are sure of correct operation, insert the poke then and only then! POKE SYSTAB+24,0 re-enables the disabled services.

RASTER OPS

The commands so far are fairly straight forward, providing an easy method of accessing the graphic features provided by the VDI, however I have left a very useful set of commands until last. The commands in question are known as RASTER OPERATIONS. Raster op's are an easy method of shifting rectangular chunks of screen memory around. Sections of the screen can be copied to RAM, RAM copied to the screen and sections of the screen copied to other sections of the screen. How?

There are three raster commands: COPY RASTER OPAQUE, COPY RASTER TRANSPARENT and TRANSFORM FORM. The commands COPY RASTER TRANSPARENT and TRANSFORM FORM while interesting are not of concern for the purpose of this article. Before describing COPY RASTER OPAQUE, I refer you to my article in Issue 32 for the description of graphic planes.

COPY RASTER OPAQUE - from ST Basic

```
POKE CONTRL,109: POKE CONTRL+2,4:
POKE CONTRL+6,1
H=INT(SOURCE/65536): L=SOURCE-
(H*65536)
POKE CONTRL+14,H: POKE CONTRL+16,L
H=INT(DESTINATION/65536): L=DESTIN-
ATION-(H*65536)
```

continued on page 72

GRAPHICS COMMANDS FROM FROM ST BASIC

To clear the screen

POKE CONTRL,3: VDISYS(1)

This clears the whole screen - including the menu bar and window leaving you with a blank screen.

To draw a line

POKE CONTRL,6: POKE CONTRL+2,2
POKE PTSIN,SX: POKE PTSIN+2,SY
POKE PTSIN+4,EX: POKE PTSIN+6,EY
VDISYS(1)

Draws a line, from SX,SY to EX,EY

To place text anywhere on the screen

POKE CONTRL,8: POKE CONTRL+2,1
POKE CONTRL+6,LEN(TEXT$)
POKE PTSIN,TEXTX: POKE PTSIN+2,TEXTY
FOR A=1 TO LEN(TEXT$): B=(A-1)*2
POKE INTIN+B,ASC(MID$(TEXT$,A,1))
NEXT A: VDISYS(1)

This command allows you to place text at position TEXTX,TEXTY. The code given assumes that the string to be printed is in TEXT$

To draw a bar in the current fill type

POKE CONTRL,11: POKE CONTRL+10,1
POKE CONTRL+2,2: POKE PTSIN,SX: POKE PTSIN+2,SY
POKE PTSIN+4,EY: POKE PTSIN+6,EY: VDISYS(1)

SX,SY are the co-ordinates of the top left hand corner of the bar. EX,EY are the bottom right co-ordinates of the bar

To draw a filled circle in the current fill type

POKE CONTRL,11: POKE CONTRL+10,4
POKE CONTRL+2,3: POKE PTSIN-,CIRCX
POKE CONTRL+2,CIRCY: POKE CONTRL+8,RAD
POKE PTSIN+4,0: POKE PTSIN+6,0: POKE PTSIN+10,0
VDISYS(1)

CIRCX and CIRCY are the co-ordinates of the centre of the circle. RAD is the radius of the circle in pixels

To draw a filled ellipse in the current fill type

POKE CONTRL,11: POKE CONTRL+10,5
POKE CONTRL+2,2: POKE PTSIN,ELIPX
POKE PTSIN+2,ELIPY: POKE PTSIN+4,XRAD
POKE PTSIN+6,YRAD: VDISYS(1)

ELIPX and ELIPY are the co-ordinates of the centre of the ellipse. XRAD is the radius in pixels in the horizontal direction. YRAD is the radius of the ellipse in the vertical direction

CONTINUED OVERLEAF

```
10   REM ***************************************************************
20   REM *                        ST Secrets series                     *
30   REM *                               by                             *
40   REM *                            COLM COX                          *
50   REM * ------------------------------------------------------------ *
60   REM *          GRAPHICS part two - ARTICLE THREE - LISTING ONE     *
70   REM *                            ST Basic                          *
80   REM *                   PAGE 6 MAGAZINE - ENGLAND                  *
90   REM ***************************************************************
100  REM
110  REM Demonstration of how  to use  VDI  graphics, giving access to the
120  REM whole screen from ST Basic. Also, features such as text sizes and
130  REM fonts are available. Type it in!
140  REM
150  REM **** SET UP CONSTANTS FOR THE DIFFERENT FONTS ****
160  REM
170  NORMAL=0:BOLD=1:LIGHT=2:ITALIC=4:ULINE=8:OLINE=16:SHADOW=32
180  REM
190  REM **** WHAT SCREEN RESOLUTION? ****
200  REM
210  RESOLUTION=PEEK(&H44C)
220  IF RESOLUTION=&H000 THEN XRES=320:YRES=200
230  IF RESOLUTION=&H100 THEN XRES=640:YRES=200
240  IF RESOLUTION=&H200 THEN XRES=640:YRES=400
250  REM
260  REM **** DISABLE GEM - SPEEDS UP PROGRAM ****
270  REM
280  POKE CONTRL,123:VDISYS(1)
290  POKE SYSTAB+24,1
300  REM
310  REM **** CLEAR SCREEN ****
320  REM
330  POKE CONTRL,3:VDISYS(1)
340  REM
350  REM **** SAY HELLO! ****
360  REM
370  TEXT$="WELCOME":CY=40:EFFECT=OLINE:HEIGHT=24:GOSUB CENTER.TEXT
380  REM
390  REM **** DRAW A DESIGN USING DRAW LINE ****
400  REM
410  POKE CONTRL,6:POKE CONTRL+2,2
420  FOR X=10 TO XRES-10 STEP 2
430  POKE PTSIN,X:POKE PTSIN+2,10:POKE PTSIN+4,XRES-X:POKE PTSIN+6,YRES-10
440  VDISYS(1):NEXT X
450  FOR Y=10 TO YRES-10 STEP 2
460  POKE PTSIN+2,Y:POKE PTSIN+6,YRES-Y:VDISYS(1):NEXT Y
470  REM
480  REM **** CHANGE DRAW MODE TO XOR ****
490  REM
500  POKE CONTRL,32:POKE CONTRL+6,1:POKE INTIN,3:VDISYS(1)
510  REM
520  REM **** THEN SOME MORE TEXT ****
530  REM
540  TEXT$="Atari ST":FOR CY=50 TO YRES-10 STEP 20
550  HEIGHT=INT(RND(1)*10)+6:EFFECT=INT(RND(1)*16):CX=CY:GOSUB TEXT
560  NEXT CY
570  REM
580  REM **** THEN RE-DRAW PATTERN IN XOR MODE ****
590  REM
600  POKE CONTRL,6:POKE CONTRL+2,2
610  FOR X=10 TO XRES-10 STEP 2
620  POKE PTSIN,X:POKE PTSIN+2,10:POKE PTSIN+4,XRES-X:POKE PTSIN+6,YRES-10
630  VDISYS(1):NEXT X
640  FOR Y=10 TO YRES-10 STEP 2
650  POKE PTSIN+2,Y:POKE PTSIN+6,YRES-Y:VDISYS(1):NEXT Y
660  POKE CONTRL,32:POKE CONTRL+6,1:POKE INTIN,3:VDISYS(1)
670  REM
680  REM **** RE-ENABLE GEM ****
690  REM
700  POKE CONTRL,122:POKE CONTRL+6,1:POKE INTIN,0:VDISYS(1)
710  POKE SYSTAB+24,0
720  REM
730  REM **** LAST OF ALL RESTORE TEXT HEIGHT + STYLE TO NORMAL ****
740  REM
750  HEIGHT=13:GOSUB SET.HEIGHT:EFFECT=NORMAL:GOSUB SET.EFFECT
760  END
770  REM ***************************************************************
780  REM * G.P.  routine to  center text  on the screen. This subroutine *
790  REM * takes its input from the string  TEXT$.  The variables EFFECT *
800  REM * and HEIGHT are used to alter the text font and the text size, *
810  REM * respectively.  The variable CY holds the Y co-ordinate of the *
820  REM * text.  The X  co-codinate is automatically calculated so that *
830  REM * the text appears centered on the screen.                      *
840  REM ***************************************************************
850  CENTER.TEXT:
860  ZZ0=LEN(TEXT$):ZZ1=ZZ0*(HEIGHT*(8+1*(EFFECT=OLINE))/13)
870  CX=(XRES-ZZ1)/2:GOSUB TEXT
880  RETURN
890  REM ***************************************************************
900  REM * G.P. routine to print text any where on the screen. As above, *
910  REM * the text to be displayed is in TEXT$,  EFFECT  &  HEIGHT also *
920  REM * alter style & height of the text.  CX,CY are the co-ordinates *
930  REM * of where the bottom left corner of the text will appear.      *
940  REM ***************************************************************
950  TEXT:
960  GOSUB SET.HEIGHT:GOSUB SET.EFFECT
970  FOR ZZ0=1 TO LEN(TEXT$):ZZ1=(ZZ0-1)*2
980  POKE INTIN+ZZ1,ASC(MID$(TEXT$,ZZ0,1)):NEXT ZZ0
990  POKE INTIN+ZZ1+2,0:POKE PTSIN,CX:POKE PTSIN+2,CY
1000 POKE CONTRL,8:POKE CONTRL+2,1:POKE CONTRL+6,LEN(TEXT$)
1010 VDISYS(1)
1020 REM ****   Set text height to variable HEIGHT                 ****
1030 SET.HEIGHT:
1040 POKE CONTRL,12:POKE CONTRL+2,1:POKE PTSIN,0:POKE PTSIN+2,HEIGHT
1050 VDISYS(1):RETURN
1060 REM ****   Set text style to variable EFFECT                  ****
1070 SET.EFFECT:
1080 POKE CONTRL,106:POKE CONTRL+6,1:POKE INTIN,EFFECT:VDISYS(1)
1090 RETURN
```

To fill an area in the current fill style

POKE CONTRL,103: POKE INTIN,COL
POKE PTSIN,FILX: POKE PTSIN+2,FILY:
VDISYS(1)

Variable COL is the colour of the border of the area. FILX, FILY are the co-ordinates of the point at which the fill is to start

Set Write mode - Determines what effect future graphic operations will have on the graphics currently on the screen

POKE CONTRL,32: POKE CONTRL+6,1:
POKE INTIN,MODE
VDISYS(1)

There are three possible values for MODE - MODE=1 is called REPLACE mode which means that operations will replace any graphics displayed on the screen in the areas of overlap. MODE=2 is called TRANSPARENT mode which means that, for example, the drawing of a circle with a clear inside will not effect any graphics inside the circle. If you drew it in REPLACE mode then any graphics inside the circle would be erased. MODE=3 is called XOR mode. If you draw a line across the screen using this mode and a circle is already displayed on the screen, the points of intersection of the line and circle will be inverted in colour.

Set Character Height

POKE CONTRL,12: POKE CONTRL+6,1:
POKE PTSIN,0
POKE PTSIN+2,HEIGHT: VDISYS(1)

The values for variable HEIGHT are in pixels and refer to the height on the character excluding the blank pixels surrounding it. The height of normal text is 13. The ST Basic PRINT statement will only work when the text size is 13. For all other text heights use the method outlined under 'To place text anywhwere on the screen'

Set Text Special Effects

POKE CONTRL,106: POKE CONTRL+6,1
POKE INTIN,EFFECT: VDISYS(1)

The values for EFFECT are listed below. To get a certain type of text just add together the given values for the effects required. Some combinations are not displayed correctly such as italics plus outline. To return to normal text the above call should be made, with EFFECT=0

EFFECT	VALUE
Normal text	EFFECT = 0
Bold text	Add 1 to EFFECT
Light text	Add 2 to EFFECT
Italic text	Add 4 to EFFECT
Underlined text	Add 8 to EFFECT
Outlined text	Add 16 to EFFECT
Shadowed text	Add 32 to EFFECT

CONTINUED ON NEXT PAGE

```
10    REM ************************************************************************
20    REM *                              ST Secrets series                       *
30    REM *                                     by                               *
40    REM *                                  COLM COX                            *
50    REM * ---------------------------------------------------------------------*
60    REM *            GRAPHICS part two - ARTICLE THREE - LISTING TWO           *
70    REM *                                  ST Basic                            *
80    REM *                       PAGE 6 MAGAZINE - ENGLAND                      *
90    REM ************************************************************************
100   REM
110   REM This program takes advantage of the fact that ST Basic stores the
120   REM elements  of an  integer array  sequentially. Therefore we use an
130   REM array to store the MFDB's.
140   REM
150   REM                Who said that ST Basic can't blit?
160   REM
170   REM  ****  WHAT RESOLUTION? ****
180   REM
190   RESOLUTION=PEEK(&H44C)
200   IF RESOLUTION=&H000 THEN XRES=320:YRES=200
210   IF RESOLUTION=&H100 THEN XRES=640:YRES=200
220   IF RESOLUTION=&H200 THEN XRES=640:YRES=400
230   REM
240   REM  ****  DISABLE GEM      ****
250   REM
260   POKE SYSTAB+24,1
270   POKE CONTRL,123:VDISYS(1)
280   REM
290   REM  ****  READ IN MFDB'S    ****
300   REM
310   DIM SOURCE%(10)
320   FOR A=0 TO 9:READ D:SOURCE%(A)=D:NEXT A
330   ADDR=VARPTR(SOURCE%(0))
340   H=ADDR/65536:L=SADDR-(H*65536)
350   REM
360   REM  ****  ALTER MFDB ACCORDING TO RESOLUTION  ****
370   REM
380   SOURCE%(2)=XRES:SOURCE%(3)=YRES:REM  CHANGE  X,Y RESOLUTION
390   SOURCE%(4)=XRES/16:REM               CHANGE X RES. IN WORDS
400   SOURCE%(6)=256000/(XRES*YRES):REM    CHANGE NUMB. OF PLANES
410   REM
420   REM  **** CLEAR THE SCREEN     ****
430   REM
440   POKE CONTRL,3:VDISYS(1)
450   REM
460   REM  **** DRAW SOME GRAPHICS  ****
470   REM
480   POKE CONTRL,6:POKE CONTRL+2,2:POKE PTSIN+2,0:POKE PTSIN+6,50
490   FOR X=0 TO 100 STEP 2
500   POKE PTSIN,X:POKE PTSIN+4,100-X:VDISYS(1):NEXT X
510   FOR Y=0 TO 50 STEP 2
520   POKE PTSIN+2,Y:POKE PTSIN+6,50-Y:VDISYS(1):NEXT Y
530   REM
540   REM  ****  SET UP ARRAYS FOR RASTER OPERATIONS ****
550   REM
560   POKE CONTRL,109:POKE CONTRL+2,4:POKE CONTRL+6,1:POKE INTIN,3
570   POKE CONTRL+14,H:POKE CONTRL+16,L:POKE CONTRL+18,H:POKE CONTRL+20,L
580   POKE PTSIN,0:POKE PTSIN+2,0:POKE PTSIN+4,100:POKE PTSIN+6,50
590   REM
600   REM  ****  THEN COPY 300 TIMES . . .             ****
610   REM
620   FOR A=1 TO 300
630   X=INT(RND(1)*(XRES-100)):Y=INT(RND(2)*(YRES-100))+50
640   POKE PTSIN+8,X:POKE PTSIN+10,Y:POKE PTSIN+12,X+100:POKE PTSIN+14,Y+50
650   VDISYS(1):NEXT A
660   REM
670   REM  **** AND THEN RE-ENABLE GEM  *****
680   REM
690   POKE CONTRL,122:POKE INTIN,0:VDISYS(1)
700   POKE SYSTAB+24,0
710   END
720   REM  **** MEMORY FORM DEFINITION BLOCK ****
730   REM  ****          alter at your        ****
740   REM  ****            own  risk!         ****
750   DATA 0,0
760   DATA 640,400
770   DATA 40
780   DATA 0,1,0,0,0
```

POKE CONTRL+18,H: POKE CONTRL+20,L
POKE INTIN,MODE: POKE PTSIN,SSX:
POKE PTSIN+2,SSY
POKE PTSIN+4,ESX: POKE PTSIN+6,ESY:
POKE PTSIN+8,DSX
POKE PTSIN+10,DSY: POKE PTSIN+12,DEX:
POKE PTSIN+14,DEY
VDISYS(1)

Where SOURCE and DESTINATION are the addresses of structures called Memory Form Definition Blocks (MFDB's). These specify the area of memory to be shifted. Their structure is:

WORD 0 H Address of point (0,0) of area to be shifted (0)
WORD 1 L If you set these to 0 the screen ram is used (0)
WORD 2 Height in pixels (400)
WORD 3 Width in pixels (640)
WORD 4 Width in words (40 - 640/16)
WORD 5 Format: 0=device specific
1=standard (0)
WORD 6 Number of graphic planes (1)
WORD 7 Reserved (0)
WORD 8 Reserved (0)
WORD 9 Reserved (0)

The default values are given for a mono screen

MODE is the way in which the operation will affect data on screen

- 0 The area covered by the raster is blanked.
- 1 The areas of intersection are set.
- 5 REPLACE mode see above.
- 6 XOR mode, above.
- 7 TRANSPARENT mode,above.
- 15 Similar to 0 but area is filled in current colour.

```
/****************************************************************************/
/*                          St Secrets series                              */
/*                                by                                        */
/*                             COLM COX                                     */
/* ------------------------------------------------------------------------ */
/*          GRAPHICS part two - ARTICLE THREE - LISTING THREE               */
/*                                "C"                                       */
/*                     PAGE 6 MAGAZINE - ENGLAND                            */
/****************************************************************************/

#define REPLACE 3          /* Raster op constants for MODE - see article     */
#define XOR 6
#define TRANSPARENT 7
#define DEVICE_SPECIFIC 0    /* Device specific flag                         */

typedef struct fdbstr    /* Structure of a Memory Form Definition Block      */
{

 long  fd_addr;          /* Address      */
  short fd_w;             /* Width        */
  short fd_h;             /* Height       */
  short fd_wdwidth;       /* Width/16     */
  short fd_stand;         /* Device spec. */
  short fd_nplanes;       /* # Planes     */
  short fd_r1;            /* Reserved = 0 */
  short fd_r2;
  short fd_r3;
} MFDB;

MFDB    screen;
short   handle,work_in[12],work_out[57];
short   xy[8],xres,yres,planes,i,x_scale,y_scale;

main()
{
    appl_init();                                  /* Must do this....        */
    init_workstation();                           /* Tell GEM were here      */
    init_screen();                                /* Draw some graphics      */
    init_raster();                                /* And set up our MFDB     */

    demo(REPLACE,"Replace mode..\0\0");           /* Then demo for each      */
    demo(TRANSPARENT,"Transparent mode..\0\0");   /* of the modes...         */
    demo(XOR,"XOR mode..\0\0");
    v_clsvwk(handle);                             /* Say goodbye to GEM      */
}

init_workstation()
{
    handle=graf_handle(&i,&i,&i,&i);              /* Get our handle          */
    for(i=0;i<10;work_in[i++]=1);
    work_in[10]=2;
    v_opnvwk(work_in,&handle,work_out);           /* Open workstation        */

    xres=work_out[0];   yres=work_out[1];         /* Get screen res.         */
    planes=1; y_scale=2; x_scale=2;
    if(work_out[13]==4)                           /* If in medium res.       */
    {
        planes=2;

/* There are 2 planes        */
        y_scale=1;                                /* Scale y axis            */
    }
    if(work_out[13]==16)                          /* If in low res.          */
    {
        planes=4;                                 /* There are 4 planes      */
        y_scale=1;                                /* Scale x&y axis          */
        x_scale=1;
    }
}

init_screen()
{
    v_clrwk(handle);


/* Clear the screen.         */
    v_hide_c(handle);
    vsf_interior(handle,1); vsf_style(handle,1);/* Hide the mouse           */
    v_circle(handle,32,20,19);                  /* Draw a circle            */
}

init_raster()
{
                                                /* Set up our raster MFDB   */
    screen.fd_addr=0;
    screen.fd_w=xres;   screen.fd_h=yres;
    screen.fd_wdwidth=xres/16;
    screen.fd_stand=DEVICE_SPECIFIC;
    screen.fd_nplanes=planes;
    screen.fd_r1=0; screen.fd_r2=0; screen.fd_r3=0;
}

demo(mode,title)
short mode;
char title[];
{
    short x,y;

    vsf_interior(handle,1); vsf_color(handle,0);/* Erase part of screen     */
    vsf_style(handle,1);                        /* Using draw box with the  */
    xy[0]=10; xy[1]=40;                         /* Fill colour set to 0     */
    xy[2]=xres-10; xy[3]=yres-1;
    v_bar(handle,xy);                           /* Then put some text on    */
    xy[0]=0; xy[1]=0; xy[2]=63; xy[3]=39;


v_gtext(handle,4,yres-(120*y_scale),          /* the screen so that the   *.
    "Some text so that");
    v_gtext(handle,5,yres-(100*y_scale),        /* effect of the different  */
    "You can see the");
    v_gtext(handle,6,yres-(80*y_scale),         /* draw modes can be seen.  */
    "effect.");

    v_gtext(handle,1,yres-(2*y_scale),title);   /* Print title              */

    for(y=40;y<=yres-60;y+=45)
        for(x=12;x<=xres-(36*x_scale);x+=69)    /* Then draw the rasters    */
        {

   xy[4]=x;     xy[5]=5;                 /* over the text...        */
          xy[6]=x+63; xy[7]=y+39;
          vro_cpyfm(handle,mode,
          xy,&screen,&screen);
        }
   getch();                                     /* Wait for a keypress      */
}
```

Having set a text effect, to see this change you must re-display any text using the function titled 'To place text anywhere on the screen'

To hide the mouse pointer
POKE CONTRL,123: VDISYS(1)

To show the mouse pointer
POKE CONTRL,122: POKE CONTRL+6,1:
POKE INTIN,0
VDISYS(1)

To read the mouse position and button state
POKE CONTRL,124: VDISYS(1)
MOUSEX=PEEK(PTSOUT):
MOUSEY=PEEK(PTSOUT+2)
BUTTON=PEEK(INTOUT)
Reads mouse - the co-ordinates returned in MOUSEX and MOUSEY are from the top left hand corner of the screen. The possible values of BUTTON are:

Value	Meaning
Button = 0	No buttons pressed.
Button = 1	Left hand button pressed.
Button = 2	Right hand button pressed.
Button = 3	Left and right hand buttons pressed.

Note that functions exist which change fill pattern, style and colour but as these are implemented by the ST Basic COLOR command I will not list these here.

Listing 2 is an example of how to use the raster op's from ST Basic. Listing 3 shows how from C.

A BRIEF EXAMPLE OF AES

Before I leave, I promised I'd give an example of AES usage. Type in Listing 4 - it's in ST Basic. This program draws a standard alert box with icon, buttons and text. If you examine the code, the string ALERT$ contains the text of the alert. The format of this string is:

[ICON][Line1|Line2|Line3|Line4|Line5][Button1|Button2|Button3]

Where ICON is a number defining which icon to be display in the alert

0 = No icon
1 = Note icon
2 = Wait icon
3 = Stop icon

Alerts can have up to 5 lines of text, separated by "|". The buttons are also separated by "|". Examine Listing 4 and change it to suit your needs. Why not include a few alerts in your own programs.

CONCLUDED OVERLEAF

ST SECRETS continued

```
10    REM ************************************************************************
20    REM *                         ST Secrets series                              *
30    REM *                                by                                      *
40    REM *                             COLM COX                                   *
50    REM * ---------------------------------------------------------------------- *
60    REM *           GRAPHICS part two - ARTICLE THREE - LISTING FOUR             *
70    REM *                              ST Basic                                  *
80    REM *                    PAGE 6 MAGAZINE - ENGLAND                           *
90    REM ************************************************************************
100   REM
110   REM **** GET BASE ADDRESS OF ARRAYS USED BY THE AES ****
120   REM
130   A#=gb
140   AES.INTIN=PEEK(A#+8):AES.INTOUT=PEEK(A#+12):AES.ADDRIN=PEEK(A#+16)
150   REM
160   REM ** YOU MUST MAKE SURE ALERT$ HAS THE CORRECT FORMAT (IN ARTICLE) *
170   REM
180   ALERT$="[1][HELLO THIS IS!AN ALERT!!DO YOU BELIEVE IT?][ YES !NO]"
190   POKE AES.INTIN,1: REM *** DEFAULT BUTTON IS "YES" (1ST BUTTON) ***
200   REM
210   REM **** THEN TELL AES WHERE TO FIND ALERT$ ****
220   REM
230   ALERTH=INT(VARPTR(ALERT$)/65536):ALERTL=VARPTR(ALERT$)-(ALERTH*65536)
240   POKE AES.ADDRIN,ALERTH:POKE AES.ADDRIN+2,ALERTL
250   REM
260   REM **** FINALLY CALL IT ****
270   REM
280   GEMSYS(52)
290   REM
300   REM **** WHICH BUTTON WAS PRESSED? ****
310   REM
320   IF PEEK(AES.INTOUT)=1 THEN 370
330   CLEARW 2:FULLW 2:GOTOXY 0,0: REM **** "NO" BUTTON ****
340   PRINT "WHAT you don't believe me???"
350   PRINT "I'm just going to have to":?"Format your disk any how!!!"
360   OPEN "O",1,"ZZZXXXYY.QQ1":CLOSE #1:KILL "ZZZXXXYY.QQ1":GOTO 360
370   CLEARW 2:FULLW 2:GOTOXY 0,0: REM **** "YES" BUTTON ****
380   ?"I'm glad to hear that but...":goto 350
```

PREVIOUS ARTICLES IN THIS SERIES APPEARED IN ISSUES 31 and 32

In a future issue I'm going to take a look at the intelligent keyboard interface and hope to see you then. My address for any queries etc is below - but if you want a reply include a S.A.E. If you live outside EIRE, International Reply coupons can be obtained from your local post office.

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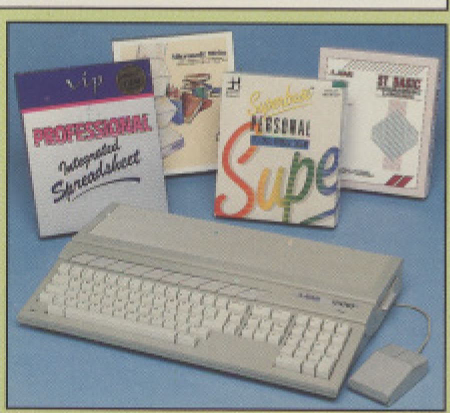
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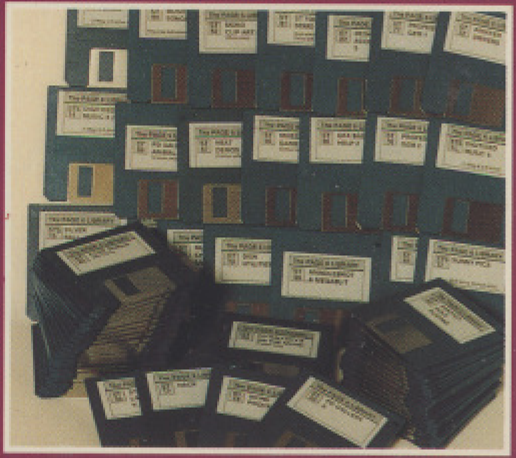
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